EXHIBIT J

IN THE UNITED STATES BANKRUPTCY COURT

FOR THE DISTRICT OF DELAWARE

In re:	)	Chapter 11
	)	
W.R. GRACE & CO., et al.,	)	Case No. 01-01139 (JKF)
	)	(Jointly Administered)
Debtors.	)	

VIDEOTAPED DEPOSITION OF TERRY M. SPEAR, Ph.D.

Taken at:

Nordhagen Court Reporting

1734 Harrison Avenue

Butte, Montana

July 29, 2009

8:35 a.m.

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I N D E X

E X H I B I T S

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TERRY M. SPEAR, Ph.D.
WEDNESDAY, JULY 29, 20 09; BUTTE, MONTANA
- - -

BE IT REMEMBERED THAT, pursuant to notice, the deposition of Terry M. Spear, Ph.D., was taken at the time and place and with the appearances of counsel hereinbefore noted before Candice L. Nordhagen, Registered Professional Reporter and Notary Public for the State of Montana.

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The following proceedings were had:

VIDEOGRAPHER: The time is 8:32. We're on the record.

This is the videotaped deposition of Dr. Terry Spear, taken by the co-counsel for Debtors and Debtors-in-Possession.

This is Case No. 01-01139 (JFK); In re: W.R. GRACE & CO., et al., Debtors.

This deposition is being taken on July 29, 2009, at Nordhagen Court Reporting; 1734 Harrison Avenue; Butte, Montana.

The court reporter is Candi Nordhagen.

The videographer is John Nordhagen.

Counsel will now introduce themselves, after which the court reporter will swear in the witness.

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MR. STANSBURY: Brian Stansbury of Kirkland & Ellis for W.R. Grace.

MR. LEWIS: Tom Lewis, for the Libby claimants.

Anybody on line?

MR. BAYLOR: Okay. Bernard Baylor, for the Asbestos Claimants Committee.

MR. RICH: Alan Rich is on the line for the Property Damage FCR. And if you take down my e-mail, I will e-mail you back my full contact information.

It's Alan, A-L-A-N @ alanrich - R-I-C-H - law - L-A-W - dotcom.

MS. ORR: This is Kate Orr for the Personal Injury FCR.

MS. CELLAROSI: Gabriella Cellarosi for Maryland Casualty.

MR. STANSBURY: Anybody --

MR. WISLER: Jeffrey Wisler, for Maryland Casualty.

MR. STANSBURY: Anybody else? Going once.

TERRY M. SPEAR, Ph.D.,
having been called as a witness by the Debtor, being first duly sworn, was examined and testified as follows:

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EXAMINATION
BY MR. STANSBURY:

Q. Good morning.
A. Good morning.
Q. Would you please introduce yourself for the record.
A. My name is Terry Spear.
Q. My name is Brian Stansbury and I represent W.R. Grace in this bankruptcy proceeding.
You are a doctor, correct?
A. Yes.
Q. What is your degree in?
A. Industrial hygiene.
Q. Okay. And where do you currently work?
A. At Montana Tech of the University of Montana.
Q. Now, Dr. Spear, you've had your deposition taken before, correct?
A. Yes.
Q. About how many times?
A. I don't know. Quite a few; I don't have that number.
Q. More than 30?
A. Probably.
Q. Less than a hundred?
A. Probably.

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Q. Somewhere in the 50-or-so range?
A. I would guess.
Q. Okay. So you're familiar with the process, then.
A. Yes.
Q. All right. I'm just going to go over a couple issues. And if you have any questions, just let me know. First, I would ask that when responding, you do so in a "yes", "no", or audible manner, as opposed to nodding your head or saying "um-hmm", just so we keep the record clean. Is that fair?
A. Yes.
Q. Also, I will strive at all times not to speak over you; and hopefully, we can avoid you speaking over me, again, for the benefit of the court reporter to keep the record clear. Is that fair?
A. That's fair.
Q. Okay. Are you under any medication today that would inhibit your ability to answer questions truthfully, honestly, and completely?
A. No.
Q. Okay. And unless stated otherwise, I'm going to presume that you understood my questions. If at any point I ask a question that for whatever reason you don't understand, please let me know so I can rephrase it or we

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can ensure that we're on the same page. Is that fair?
A. That's fair.
Q. Okay. You say you're at Montana Tech at the University of Montana?
A. Yes.
Q. And what is your title?
A. My title is professor and department head.
Q. And that's the -- what is the actual, what is the department?
A. The department is the Safety, Health and Industrial Hygiene Department.
Q. Okay. And how long have you worked there?
A. I have been at Montana Tech for 26 years, I think.
Q. Uninterrupted?
A. For the most part. Yeah, I haven't had any other employment with other companies.
Q. Okay. What is your educational background?
A. My, from -- well, my educational background is a bachelor's degree in microbiology from the University of Montana.
Q. Is that in Missoula?
A. Yes.
Q. Okay.
A. And then a master's of science degree in

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industrial hygiene from the University of Minnesota, and then a Ph.D. in industrial hygiene from the University of Minnesota.
Q. When did you get your Ph.D. from the University of Minnesota?
A. It was awarded in 1996, I believe.
Q. Okay. And was that -- were you still working at Montana Tech at the time?
A. Yes.
Q. Were you alternating between going to classes at the University of Minnesota and coming back to Montana Tech, or what was the arrangement?
A. I did take a leave of absence, I believe it was in the late '80s, and went back to Minnesota and took classes. And then I -- there were other trips back and forth to Minnesota from Montana Tech, not any extended trips, but basically traveled back and forth to do examinations and such.
Q. Now, at Montana Tech, are you teaching courses right now?
A. Yes.
Q. What courses do you teach?
A. Oh, I, over the years, I've taught many different courses. Now I primarily teach courses in respiratory protection, courses in sampling strategy,

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small particle technology.
Q. Okay.
A. I think those are the main ones.
Q. Let me just, let me unpack this a bit just so I'm clear. We're in the summer right now. So let's say last spring, which courses did you teach?
A. Last spring I taught respiratory protection and I believe it was sampling strategies.
Q. Okay. Let's talk about respiratory protection. Could you briefly describe what that class entails?
A. It entails providing -- teaching the students how to develop a respiratory protection program, going through the different types of respirators, fit testing of workers who have to wear respirators, training in respiratory protection.
Q. And in the course of that class, is there any point in that class when you deal with, for example, asbestos in particular?
A. Yes.
Q. How prevalent was that, was asbestos, in the discussion in your class?
A. Well, since I do a lot of work in asbestos, I make sure that I cover the topic with the students. And I mean it certainly isn't the focus of the class, but we

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talk about respiratory protection where asbestos is concerned.
Q. Okay. And you said "tree samplings"? Was that the other --
A. Pardon me?
Q. What was the other course you said?
A. Sampling strategies.
Q. Oh, sampling strategies, I'm sorry, I misunderstood. Sampling strategies, and what is that?
A. That's a course involving designing sampling strategies for contaminants in the workplace.
Q. And by that, you mean, for example, taking air samples?
A. Well, yeah. It's not an instrument course. You know, that's covered in the sampling course, a different course. But it's mainly how do we assure that we're collecting representative samples, defining exposure groups, and things pertaining to that.
Q. Do you teach graduate or undergraduate students?
A. Those two classes are graduate classes.
Q. Okay. Now, other than your coursework at Montana Tech, what other work have you done in the past ten years related to asbestos in particular?
A. Other than -- what was the first part of your

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question?
Q. Teaching at Montana Tech. You mentioned respiratory protection, a course which, you know, relates to asbestos exposure. Other than -- and I guess what I'm really trying to get to is: Beyond your role as an educator, what work have you done in the last ten years related to asbestos?
A. Well, we've been doing research pertaining to asbestos for longer than ten years, since about 2003; consulting work pertaining to asbestos.
Q. Okay. Now, let's look at the -- if I read -- it would be research work and consulting work. Let's start with the research work. Now, what research projects have you worked on related to asbestos?
A. The research has involved evaluating asbestos exposure pathways associated with the amphibole asbestos in Libby, and then also doing research pertaining to vermiculite or other asbestos-containing materials within homes.
Q. And by vermiculite in homes, are you referring to vermiculite attic insulation?
A. Yes.
Q. Any other type of vermiculite product in the home that was studied?
A. No, it was primarily vermiculite attic

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insulation -- or is primarily vermiculite attic insulation; wall, some wall insulation.
Q. Oh, vermiculite attic insulation that was put in the walls. Is that what --
A. Yes.
Q. Okay. So the asbestos pathways in Libby, which pathways have you studied?
A. We've been looking primarily at the dispersion of asbestos from the mine site into the forest beyond Libby and into the town of Libby and along transportation corridors.
Q. Now, is that dispersion in any way ongoing or is it simply studying historical dispersion?
A. Well, we believe that there's evidence that it's ongoing, but is what we're doing is basically evaluating, trying to determine the boundaries of this contamination, so it's not always easy to tell if it's historical or current.
Q. Okay. And so the dispersion of the asbestos from the site in the ambient air? Is that --
A. Well, that was one way it was dispersed was ambient air, and I'm sure it was dispersed through movement by machines and road dust and things like that.
Q. So that would be human activity in the mine site and surrounding area kicking up dust. Is that a way

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of describing that?
A. That would be fair.
Q. Okay. Any other pathways other than asbestos traveling in the ambient air and people kicking up dust around the mine site?
A. Well, and the transportation of it; the loading of it and the transportation of it.
Q. Okay. So ambient air, we'll call it "activity that unsettles settled dust." Is that a fair way of describing that?
A. Yes.
Q. Okay. And then you said the transportation of it?
A. Yeah, loading and transportation of it, I believe is what I said.
Q. And would that refer to loading and transportation involving rail lines?
A. Well, rail lines or other types of loading, truck loading and things like that, I guess.
Q. Where was the truck loading occurring?
A. Well, just basically from the mine and then being transferred down to different points along the highway and then unloading by truck. And so I'm just trying to cover all the different aspects of how they would load it.

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Q. Okay. So transportation loading and unloading, is that a fair way of describing the third pathway?
A. Yes.
Q. Okay. Any other pathway for potential exposure in the communities, let's say, in Libby that you've studied?
A. Not currently, we haven't.
Q. What about historically?
A. Well, no, none of the research has involved -- that research has not involved any in-house types of sampling. The vermiculite research has.
Q. Oh, and that would be -- okay, I understand what you're saying. So when you refer to vermiculite, this is what we were speaking of earlier, which was the Zonolite attic insulation that was in attics and also was in, in some cases, the walls of homes, correct?
A. Yes.
Q. Okay. So we can just make that the fourth item on the list where we have asbestos traveling from the mine site from the ambient air; asbestos kicked up around the mine site by human activity; transportation, which includes loading and unloading of vermiculite; and then Zonolite attic insulation in homes. Are there any other pathways of exposure besides those four that you have

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studied?
A. That I have studied, no.
Q. Okay. Are there any other pathways other than those four that you are aware of?
A. Well, I think there's, again, there's a lot of activity that go on in homes that could stir up asbestos dust there and create exposures.
Q. From Zonolite attic insulation or from some other source?
A. Well, it could be from attic insulation or it could be from other sources that made their way into the home.
Q. Are you aware of any other sources?
A. Well, windblown dust.
Q. Okay. So that would be, again, kind of under the first heading which would be asbestos that's blown from the air, blown through the air from the mine site. Is that what you're referring to there?
A. That would be one method, yes.
Q. Okay.
A. And then transport just by human activity, carrying it in on your clothes or your feet.
Q. Okay. And so this research that you've done, on whose behalf was it performed?
A. The research that we began in 2003 was, was

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funded through a COBRE Grant, the University of Montana.
Q. And which, so I'm clear, which was the 2003 research?
A. That's doing the Libby work.
Q. So all those, all four categories you were speaking of earlier, all that's been funded by a grant through the University of Montana that was issued in 2003?
A. Well, in part.
Q. In part.
A. It began with funding from COBRE, the University of Montana, and then there was some funding provided from the University of Utah to do some later work in the more recent years.
Q. And which work was that, the more recent work in later years you mentioned?
A. We've been working with the Forest Service to determine potential occupational exposure within their jobs within the forest around the mine.
Q. Okay. And this work was what was ultimately published in a series of papers, correct?
A. Yes. In fact, let me correct myself a little bit here.
Q. Okay.
A. The University of Utah funded the initial firewood harvesting simulation study.

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Q. Okay. So let me write that down real quick. The University of the Utah, the harvesting study. And was that the study that was published in 2007?
A. I believe so.
Q. Okay, okay. What other studies -- what other sources of funding were involved with other studies that you've published?
A. Well, the Forest Service is funding the studies we're doing for them.
Q. And which study is that?
A. The occupational exposure of Forest Service workers.
Q. And have the findings of that study been published in a paper?
A. Not yet.
Q. Okay. The work you've done for the Forest Service, is it in any way bearing on your opinions in this case?
A. Yes.
Q. Is it something that you have produced, these findings that you have? Have you taken samples?
A. Yes.
Q. When did you take these samples?
A. I believe it was -- we did the initial Forest Service sampling or study last summer, not this summer but

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last summer.
Q. And this is in Lincoln County?
A. Yes.
Q. Okay. How many samples did you take?
A. Boy, that's a -- we do a series of air sampling, personal air sampling; and then we also do wipe sampling of Tyvek clothing they were wearing for protection.
Q. And personal air sampling, is that often abbreviated PBZ?
A. Yes.
Q. Okay. And that's "personal breathing zone"; is that right?
A. Yes.
Q. Okay. So you do personal breathing zone sampling. And then you said "wipe sampling"?
A. Yes.
Q. What is wipe sampling?
A. Wipe sampling is wiping a surface or a garment with, basically, an alcohol wipe to remove dust or asbestos.
Q. Okay. So you have done both personal breathing zone sampling and wipe sampling for the Forest Service. And this was, I believe you said, the summer 2008, correct?

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A. I believe that's when we did it.
Q. Do you have an estimate of how many samples you took?
A. Well, I would say the air samples, I would estimate that we took -- I don't know if it was in the range of 50 samples.
Q. And what about the wipe samples?
A. Well, the wipe samples, we used composite wipes. So if you count individual wipes, there were probably maybe 60 or 70 wipe samples. I don't remember the exact numbers.
Q. And this work that you've done for the Forest Service, just so I'm clear, this is not the work that was published in the recent publications that you have authored related to your work in Libby, correct?
A. It has not been published yet.
Q. Okay, not yet. So it's not available to the public, then, correct?
A. That would be correct.
Q. Okay. However, you say this does inform your opinion about potential exposures in Libby?
A. In and around Libby, yes.
Q. Okay. How so?
A. Well --
MR. LEWIS: Well, wait now. I want to object.

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He hasn't said that it forms his opinions in this case. It's not a completed study. He hasn't reached final opinions. Okay? And it informs his opinions generally, but he's not testifying it informs his opinions in this case.
MR. STANSBURY: I will ask going forward you not coach the witness through your objections.
You may answer the question.
THE WITNESS: Well, yeah, all of the work that we do in Libby informs me generally as to the, you know, the dispersal of the asbestos in and around Libby. Obviously, this work hasn't been published. We haven't even finalized the results for the Forest Service occupational study, so -- (pause.)
Q. (By Mr. Stansbury) But you are aware of the results, correct?
A. I'm aware of results.
Q. And that is something which impacts your understanding of potential exposures in and around Libby, correct?
A. Well, this focused on the Forest Service occupational study, so it's a narrow -- much narrower than the bark studies. Let's put it that way.
Q. But it would still impact, let's say, forest workers working in the forest in and around Libby,

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correct?
A. I'm sorry, what would impact?
Q. The findings of your work for the forestry department. The work you've done for the forestry department and the samples taken and your analysis of those samples informs your opinion about potential exposure somebody would have in the forest around Libby, correct?
A. Well, in terms of Forest Service employees, yes.
Q. Okay. And what are Forest Service employees, just so I'm clear?
A. Well, these are people that work for the Forest Service and do work that the Forest Service requires them to do.
Q. And what is that? What kind of work is that?
A. Well, they do trail maintenance, and they do tree measurement, and they evaluate forests for forest health, and they have test plots where they evaluate tree growth. And that's part of what they do.
Q. What kind of -- and so when you did --
A. They fight forest fires.
Q. So when you did this study, you simulated activities, correct?
A. Yes.

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MR. LEWIS: Objection; that's not what he's testified to so far.
Q. (By Mr. Stansbury) I believe your answer to the question was "yes"?
A. For the Forest Service, we simulated the activities that they would perform.
Q. And which activities were those? Just so I'm -- you mentioned some activities earlier, but just so I'm clear, which activities did you simulate?
A. We simulated trail maintenance when they're clearing trails.
Q. Okay.
A. We simulated tree measurement.
Q. Okay.
A. We simulated walking through the forest if they were walking to get to a stand of trees to evaluate.
Q. Okay. Anything else?
A. And we simulated fire line construction.
Q. What is fire line construction?
A. If there's a forest fire, and it's the constructing of a fire line around the fire.
Q. How is that constructed? Is it made of -- what is it made of?
A. It's done with hand tools.
Q. Hand tools. And where, generally, did you

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conduct these simulations?
A. The area was probably - let's see if I can get my directions right - probably northeast of where the mine site was outside of the restricted zone of the mine, and essentially between the mine and Lake Koocanusa.
Q. We might need some help with spelling on that one later on.
Any other research other than what we've discussed this morning? Any other asbestos-related research?
Let me rephrase this: Have you conducted any other asbestos-related research other than what we've discussed so far this morning?
A. Let me think for just a second. I don't believe so.
MR. LEWIS: Counsel, I'm not going to coach the witness, but I, but I don't know if you intended by "research" formal research projects or background research many years ago. From the witness's answer, I'm not sure he understood the question.
MR. STANSBURY: That would be coaching the witness.
MR. LEWIS: No, it is not coaching the witness sir. I'm trying to clarify the record here. Your question was broad. And what do you mean?
I'll make a formal objection. The question is

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vague because it refers to "other research" without defining what you mean by "other research"; and therefore, it's an improper question.
Q. (By Mr. Stansbury) Dr. Spear, is there any other research that you conducted related to asbestos other than what we've discussed this morning?
A. Well, the understanding of our questioning along those regard is that you were asking about research that we were performing in Libby to collect data and publish results.
Q. Okay, then let's clarify this. And again, to the extent that you ever misinterpret or are concerned you may be, please feel free to raise it.
Other than Libby, is there any other research related to asbestos generally that you've performed?
A. Well, I performed literature research of asbestos.
Q. And what is literature research? Does that mean reviewing literature?
A. Yes.
Q. Okay. But that's not, for example, taking samples and analyzing the samples and reaching conclusions based on the sampling, correct?
A. Correct.
Q. Okay. What type of literature reviews have

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you done?
A. Just literature reviews to, in my own mind, understand the knowledge of asbestos and the hazard of asbestos over time, and how companies were dealing with these issues, and things like that.
Q. When did you first conduct - and I'm going to use the term "comprehensive", and if you have any question, please feel free to -- I'm happy to clarify. When did you first conduct a comprehensive review of asbestos literature?
MR. LEWIS: Object to the form of the question on the grounds that it's compound and unintelligible as stated.
THE WITNESS: Yeah, I mean what you consider comprehensive, I may not.
Q. (By Mr. Stansbury) Okay.
A. I mean to me, that's a confusing word.
Q. And let's get that, let's figure that out.
When did you first review any article related to asbestos?
A. Well, probably back in 1978.
Q. Okay. Do you remember what that was?
A. I don't remember what it was.
Q. Okay. When did you first decide to seek out asbestos literature specifically for purposes of

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researching and broadening your understanding of asbestos literature?
A. Probably in 1979.
Q. And what was the reason for doing that?
A. Because I was working at a copper smelter in Anaconda, and we certainly had asbestos-containing materials there. And we had issues that I had to look up pertaining to asbestos.
Q. What kind of articles did you read?
A. Well, at that time, I'm sure I read the OSHA and the NIOSH publications, and some of the textbooks or National Safety Council information; Patty's Industrial Hygiene and Toxicology, things like that, that provided information on asbestos.
Q. Did you survey epidemiological literature?
A. I'm sorry?
Q. Did you read epidemiological literature?
A. I'm sure I did.
Q. Okay. Do you recall any studies that you reviewed in 1979?
A. No. I'm sure I saw the Doll study in 1979. I don't specifically recall all the articles I looked at in 1979, I'm sorry.
Q. Okay. Did you continue -- well, let me rephrase that. Do you have any idea of how many articles

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you reviewed in 1979?
A. I don't have. I don't. I can't give you a number. I mean it's many years ago and I don't remember the articles I looked up.
Q. Okay. Did you stay current with the asbestos literature after 1979?
A. Yes.
Q. What publications would you review on an ongoing basis after 1979?
A. Well, the publications in the American Industrial Hygiene Association Journal and the American Conference of Governmental Industrial Hygiene Association Journal.
Q. So those are both, as the title would imply, publications aimed at industrial hygiene issues, correct?
A. Well, yes, I believe that would be correct, then.
Q. So they would look at things such as exposure levels, sampling methods, issues like that, correct?
MR. LEWIS: Objection; that's a compound question.
But you can answer, Doctor.
THE WITNESS: Well, yeah, I mean it could cover many different aspects. I mean there were -- you know, they would talk about protecting workers through

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sanitation, and clothing, and showers, and things like that. Sure, I mean it would cover not only sampling and standards, but how do we control the exposures.
Q. Okay. Do these articles --
A. The Annals of Occupational Hygiene, obviously, too, is another one that was -- that I considered to be important even back in the late '70s.
Q. But would these publications contain mortality studies of cohorts exposed to asbestos?
A. They could provide summaries of those types of studies.
Q. But that would not be the central focus of these articles?
A. Well, I'm not sure. I mean the -- certainly, a lot of the textbooks and the articles that you're referring to discussed mortality and rates of death from asbestos exposure.
Q. Okay. What about pulmonary function testing? Was that an area of asbestos medicine that you stayed current on during this time period?
A. Not really.
MR. LEWIS: Objection. This witness is not a medical doctor. He's not qualified to testify as to pulmonary studies.
Q. (By Mr. Stansbury) You may answer the

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question.
A. Well, yeah, I'm not a medical doctor. I certainly read medical literature and toxicological literature. I'm not a toxicologist, I mean, but it all informs me concerning the subject matter of asbestos.
Q. Okay. Well, let's, I guess, then, kind of go through some of the areas where you -- well, some of your qualifications, so to speak, with respect to different aspects of asbestos disease.
MR. LEWIS: Objection to the form of the question.
Q. (By Mr. Stansbury) You mentioned that you have no medical training, correct?
A. Correct.
Q. Okay. And that would include no training in radiology, correct?
A. Correct.
Q. No training in pulmonary medicine generally, correct?
A. Correct.
Q. Do you have any experience obtaining exposure histories from a patient?
A. No.
Q. And so, of course, you're not able to diagnose patients with asbestos-related disease, correct?

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A. Correct.
Q. Do you have an opinion on whether there is a distinction between individuals who have developed an asbestos disease from exposures in Libby, Montana, as opposed to individuals who have developed an asbestos disease from exposures outside of Libby, Montana?
MR. LEWIS: Could the court reporter read back the question? It's a long question and I'm not sure I understand it.
(The pending question was read by the court reporter.)
MR. LEWIS: Okay. I'm going to object to the form of the question on -- it's vague. The word "distinction", I don't know what you mean by that. Perhaps the witness does, and I'm not going to coach him or interfere with his answer, but the question is vague and overbroad.
THE WITNESS: I had, you know, I had two questions pertaining to the question. And --
BY MR. STANSBURY:
Q. Sure. What were your questions?
A. What do you mean by, yeah, the distinction between individuals? Are we talking about male versus female?
Q. Okay.

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A. And then the second question is: When you say exposure outside of Libby, are we talking about exposure to asbestos, or different types of asbestos, or what are we talking about?
Q. Good, and I appreciate you asking me about that, any questions you have.
Obviously, you're aware that people who are exposed to asbestos may develop disease, correct?
A. Yes.
Q. And people in Libby have been exposed to asbestos from Libby and developed disease, correct?
A. Correct.
Q. And people, let's say, in Pascagoula, Mississippi, have been exposed to asbestos and developed disease from those exposures, correct?
A. Yes.
Q. Often asbestos that had nothing to do with Libby, Montana, correct?
A. That could be correct.
Q. And those, you know, just from your general review of the medical literature, you are aware that these diseases fall into -- there are different types of diseases associated with asbestos exposure, correct?
A. Correct.
Q. Mesothelioma, correct?

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A. Yes.
Q. Lung cancer?
A. Yes.
Q. And there are also various forms of non-malignant asbestos-related diseases, correct?
A. Correct.
Q. And that could include asbestosis, correct?
A. Yes.
Q. Fibrosis of the pleura, correct?
A. Yes.
Q. And do you have any opinion as to how any of those diseases would manifest themselves differently in a person whose exposure was to asbestos in Libby as opposed to a person who was exposed to a different type of asbestos outside of Libby?
A. Yes.
Q. You have an opinion?
A. Based on my review of the Libby work and the medical literature.
Q. What is that opinion?
A. My opinion is that the asbestos, the amphibole asbestos in Libby seems to be causing a very severe pulmonary fibrosis which is progressive and fast-acting and can lead to death, which is different than what's been seen in other cohorts exposed to different types of

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asbestos.
Q. Okay. So let's unpack that. So the answer to my question would be you do have an opinion, and your opinion relates not to mesothelioma or lung cancer, per say. The opinion you stated relates to that non-malignant disease, correct?
MR. LEWIS: Objection. He didn't testify to everything you asked him to assume by that question, if that is a hypothetical question, and the question is compound.
Q. (By Mr. Stansbury) You may answer.
A. What I referred to was the pulmonary fibrosis.
Q. Okay. Which is a non-malignant disease, correct?
A. Yes.
Q. Do you have an opinion as to any difference involving lung cancer or mesothelioma?
A. Well, I testified in previous depositions regarding Libby that there are certainly some medical literature that is saying that the tremolite - in that case they were talking about tremolite, not Libby amphibole - is a long, thin fiber, and it has been shown to be a very potent mesothelioma causer.
Q. Okay. So you do have an opinion regarding Libby disease -- strike that.

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You do have an opinion with respect to mesothelioma. What about lung cancer? Do you have an opinion about how a person exposed to asbestos in Libby as opposed to a person exposed to a different type of asbestos elsewhere may develop lung cancer?
A. Well, I think all forms of asbestos can cause lung cancer.
Q. But you don't have an opinion as to weather Libby asbestos has a greater likelihood of causing lung cancer as opposed to another form of asbestos?
A. I don't really have an opinion on that.
Q. Okay. So let's talk about your mesothelioma and your pulmonary fibrosis opinions. Let's start with the pulmonary fibrosis. And what type of pulmonary fibrosis are you talking about? Are you talking interstitial disease or are you talking about pleural disease?
A. Pleural.
Q. Okay. Do you have an opinion as to how exposure to Libby tremolite affects interstitial disease compared to the way other forms of asbestos cause interstitial disease?
A. Well, I don't. I can't comment on medical diagnosis or medical findings. All I'm saying is I draw my opinion or I form my opinion based on what I'm reading

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in the medical literature.
Q. Okay. So from what you're reading in the medical literature, can you identify any piece of literature that would support an opinion that exposure to Libby asbestos would have a greater likelihood of causing interstitial disease as opposed to other forms of asbestos?
A. I don't.
Q. Okay. But you do have that opinion with respect to pleural disease, correct?
A. Yes.
Q. Okay. So let's focus, then, on pleural disease. Now -- and maybe I should take one quick step back. When we're talking about asbestos from Libby, what is the asbestos from Libby?
A. Asbestos from Libby is a mixture of amphiboles.
Q. Which amphiboles?
A. Well, it's what's been identified as winchite and richterite and tremolite, and then another one that I can't pronounce, riebeckite, or some long name that I don't even try to pronounce.
Q. Now, are there any difference -- what are the differences between winchite and tremolite?
A. Well, my -- I'm not a mineralogist, either,

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but my understanding is that they're in the same mineral family, but there's differences in, I think, sodium and potassium for one. But again, I'm not a mineralogist.
Q. Okay. The same question with respect to richterite. Are you available -- are you aware of any differences between richterite and tremolite?
A. Well, again, the same mineral family, to my knowledge.
Q. Okay. The majority of the amphibole in Libby is winchite, correct?
A. Yes.
Q. In fact, based on what's in the literature, often tremolite would be as low as 6 percent of the amphibole material in the ore from Libby, correct?
A. It could be.
Q. Okay. It could be higher, correct?
A. Yes.
Q. But in some cases, over 80 percent was winchite, correct?
A. Yes.
Q. Okay. So is it fair to say winchite is the predominant amphibole in the Libby amphibole?
A. According to Meeker, I believe that would be his assumptions, that it's mostly winchite, followed by richterite, followed by tremolite.

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Q. And you, you rely on Meeker, don't you, in your expert report?
A. Well, I rely on his mineralogy expertise, I guess, yes.
Q. Okay, okay. So when we're talking about Libby amphibole, we're talking about a mix of these four amphiboles, correct?
A. Yes.
Q. Okay. And so if I use the term "Libby amphibole," you understand I'm referring to the four amphiboles found in Libby, Montana, correct?
A. Yes.
Q. Okay. So let's go back to the pleural disease. What is your opinion about any differences in the way pleural disease has manifested itself in people exposed to the Libby amphibole?
A. Well, again, I'm not a toxicologist or a medical doctor, but these are amphiboles. We know that amphiboles, in general, are toxic and cause severe lung disease. And so now we have a combination of amphiboles, and so, obviously, it's going to be toxic. And my opinion basically comes from talking to the doctors in, in Libby.
Q. Okay. And you kind of led me to where I wanted to go, because your opinions are not based on your training as an industrial hygienist, correct? Your

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opinions -- let me rephrase that.
Your opinions about pleural disease in Libby are not based on your training as an industrial hygienist, correct?
A. Well, we don't get medical training as an industrial hygienist.
Q. Okay. What specific opinions do you have about pleural disease in Libby? You mentioned them earlier, but I just want to make sure that we're clear about them so we can go over them.
A. I'm sorry, what --
Q. You mentioned that you thought pleural disease in Libby was - and again, I'm paraphrasing here, and I'd like you, to the extent that I misstate this, correct it - it's progressive, progresses to death. You mentioned a couple of things about pleural disease in Libby very quickly when we were talking about it earlier, and I just wanted to go over that real quick. If you would, please, identify those.
A. Well, in reading the literature and talking to Dr. Black specifically, he's seeing in his patients pleural disease which is occurring quicker or manifesting itself sooner than they would normally expect; it's more painful than other types of exposures outside of Libby; it is progressive, they're seeing progression of this

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disease; and it can be fatal; it's affecting pulmonary function.
Q. So we have pleural disease in Libby that, unlike other pleural disease elsewhere, occurs quicker, is more painful, progressive, and can be fatal. Did I summarize that correctly, sir?
A. That's my understanding, yes.
Q. Okay. And are these opinions that you intend to offer when you testify?
A. Well, I don't know if, if I'm, you know, if I'm allowed to offer anything related to medical. I mean I'm an industrial hygienist. I'm just saying I read the medical literature, I work in Libby, I work with Dr. Black as a technical advisor to the TAG, and I get this information from the doctors.
Q. Okay. So -- and I guess because I asked earlier if you had an opinion, and perhaps I should be more specific, when I ask if you have an opinion on this, you may have an opinion on the weather, but do you have an -- is this an opinion that you believe that you can testify about in court?
A. I don't even know how to answer your question. I'm not a lawyer. I don't know if I would be allowed to opine that.
Q. Do you believe that you are qualified to opine

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on those issues?
A. Well, if, if, you know, reading the medical literature and speaking to doctors in Libby qualifies me, then, yes.
Q. Because that would be the extent of your basis for this opinion. It's review of medical literature and discussion -- I think you identified Dr. Black. That was the basis of your opinion about Libby pleural disease, correct?
A. Yes.
Q. Okay. Which literature have you reviewed to form this opinion?
A. Well, different studies by, I guess, Patricia Sullivan, Rohs, Lockey, the Peipens publication, Dr. Whitehouse's publications.
Q. So that would be the Sullivan study, the Rohs study, the Lockey study, the Peipens study, and then you mentioned Dr. Whitehouse's publications. Are there any other publications that have informed your opinions about pleural disease in Libby?
A. Well, I'm sure there are. Those are the ones that come to mind. I mean it's hard for me to pinpoint specific publications as we sit here.
Q. Okay. And the Sullivan study, that is the NIOSH mortality follow-up study, correct?

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A. Yes.
Q. And does that study in any way identify or address the pain involved with pleural disease?
A. Not that I know of.
Q. Okay. Does it discuss the onset of pleural disease in particular?
A. I don't -- I haven't read the article in awhile. You know, it's mainly a mortality study to look at the mortality of workers that worked at the mine.
Q. Right.
A. So it may not be specific to pleural disease for all I know.
Q. Okay, okay. And the Rohs study, that is a study, a follow-up study -- I guess when I say "the Rohs study," we can kind of put Rohs and Lockey together, correct? We're talking about the study of the workers in the O.M. Scott facility in Marysville, Ohio, correct?
A. Correct.
Q. Okay. So the Lockey/Rohs study, Lockey published in the early '80s, correct?
A. Yes.
Q. And then Rohs published a follow-up in, I think, either 2007 or 2008, correct?
A. Yes.
Q. And what about the Rohs study informed your

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opinion about pleural disease in Libby?
A. Well, it's pointing to a greater toxicity of the Libby amphibole, that we're seeing disease in lower concentrations than we have in previous studies pertaining to other types of asbestos.
Q. And so just so I'm clear, what she reports are the exposure levels at the Marysville facility, correct?
A. Who are we referring to?
Q. Rohs.
A. Okay.
Q. I'll repeat the question. Dr. Rohs reports the exposure levels at the Marysville facility, correct?
A. Yes.
Q. And she also reports the prevalence of pleural abnormalities among the workers, correct?
A. Yes.
Q. And she breaks down the population into quartiles, correct, or is it quintiles?
A. As far as I remember, yes. I haven't looked at those in awhile, either.
Q. But four or five exposure categories, correct?
A. Yes.
Q. And one of the findings of the studies that she focuses on is that we see pleural abnormalities in the lower exposure quartile, correct?

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A. Could you repeat that?
Q. One of the important findings she addresses in the study was that there were individuals with an elevated level of pleural abnormalities in the lowest exposure quartile, correct?
A. I believe that's correct.
Q. Are you aware of any other finding in that study that impacts your understanding of pleural disease from exposure to asbestos in Libby?
A. Well, I get the Rohs and the Lockey study mixed up, just in my mind, but -- you know, so they saw, in the early years, they saw a certain percentage of people with pulmonary disease. And then they followed these people up after 20-something years, and it went from like 4 percent pleural disease up to 26 percent pleural disease.
Q. Right, right. And so that's -- the percent you're talking about is the prevalence of pleural abnormalities in the working population, correct?
A. Yes.
Q. Okay. But nothing in that study addresses the pain of pleural disease, correct?
A. Well, that's correct.
Q. Okay.
A. I guess they don't have the opportunity to

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talk to the patients in Libby.
Q. Well, the people in Marysville, Ohio, were exposed to Libby amphibole, correct?
A. Right. But I'm just saying I get this information from Dr. Black who tells me what's --
Q. Oh, I understand.
A. -- what's being reported.
Q. For now let's focus specifically on the literature rather than the conversations with Dr. Black. There's nothing in the Rohs study which addresses the pain involved with Libby pleural disease, correct?
A. Not that I know of.
Q. Okay. And the Rohs study was a morbidity study, did not look at mortality, correct?
A. Right.
Q. So there is nothing in that study that would support an opinion regarding the fatality involved with Libby pleural disease, correct?
A. I believe that would be correct.
Q. And the issue of "occurs quicker", how does the Rohs study impact that opinion?
A. Well, other than the fact that, you know, it was reported that with time-weighted average exposure levels of, I think it was, 0.3 to 0.4 or 0.5 per cc averaged over an eight-hour day, they were still seeing

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pulmonary abnormalities. And this was among a working population that was working at the time, so I guess from that standpoint. But again, the "quicker" part comes from, again, the discussion with Dr. Black --
Q. Okay.
A. -- that we're seeing these things happen quickly.
Q. So just to be clear, then, the Rohs study does not support an opinion about the onset of Libby pleural disease from first exposure, does it?
MR. LEWIS: Object to the form of the question using the term "support". It implies something that is not present by his prior answer. To the extent that the question purports to summarize a prior answer, it incorrectly does so and is therefore improper.
MR. STANSBURY: I'm going to ask that you keep your objections in line with the Federal Rules of Civil Procedure, state them briefly and succinctly to preserve the record, and not coach the witness.
You man answer, sir.
MR. LEWIS: I'm going to -- I want to make a statement on the record. There was no coaching there. When I practice before the Federal Courts, I understand that you have to inform the Court of the basis for your objection and not just make some small objection like, "I

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object to the form of the question." That's improper. And that's all I did, and there was no coaching of the witness in that objection.
MR. STANSBURY: Again, I'm going to ask you to state the objection succinctly and briefly.
You may answer the question.
MR. LEWIS: That was as succinctly and briefly as I could make my objection given the nature of your question.
THE WITNESS: I think we should back up because I don't know where we were.
MR. STANSBURY: I think that was his objection in the first place was to create that impression of not knowing where we are.
MR. LEWIS: I move to strike statement of Counsel on the record. It's improper. He's not a witness. He's a lawyer. He needs to, he needs to shorten up his questions and ask understandable questions so we don't have these objections.
MR. STANSBURY: Could you read back the last question before the exchange that I had with Mr. Lewis?
(The record was read by the court reporter as follows:
"QUESTION: So just to be clear, then, the Rohs study does not support an opinion about the onset of

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Libby pleural disease from first exposure, does it?")
THE WITNESS: Well, from my recollection, it doesn't.
Q. (By Mr. Stansbury) Okay. And then that leaves "progressive." And I guess maybe I should ask you to explain what you mean when you say something is progressive.
A. Well, my understanding is that it refers to the progression of the disease after the exposure stops.
Q. And how is this a unique or distinct manifestation in Libby?
A. Well, again, in speaking -- reading the medical literature I've read and talking to Dr. Black, they believe that it's progressing.
Q. But if I'm exposed to asbestos working in Mississippi, it's chrysotile asbestos, for a few years and then my exposures stop, I'm still at risk of developing disease, correct?
A. Well, yes, but it may not progress. It may not continue to envelope different portions of the lung. Again, I'm not a medical doctor.
Q. Okay. So again, I think that your qualifications here, perhaps this, you know, can close up some of this discussion. You're not a medical expert. These issues as to whether Libby disease occurs quicker,

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is more painful, is more progressive, or is more fatal, these are not issues in which you intend to offer opinions at the confirmation hearing?
MR. LEWIS: Objection; that's a compound question.
THE WITNESS: Well, those, those are my opinions based on what my understanding is of the situation. And if someone asks me for that opinion, I'd just repeat what we did today.
Q. (By Mr. Stansbury) Okay. And so then we'll just tie this up real quick, then. We discussed Sullivan, we discussed Rohs and Lockey, and then you mentioned Peipens as well, correct?
A. Yes.
Q. And that was the published finding of the ATSDR screening analysis, correct?
Let me rephrase that. Peipens' paper was the published results of the ATSDR's medical surveillance program in Libby in the summers of the 2000 and 2001, correct?
A. Yes.
Q. Okay. And that study examined individuals by giving them a questionnaire, administering an x-ray, and examine -- strike that.
In that medical surveillance, the ATSDR had each

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person fill out a questionnaire, correct?
A. I believe that's correct.
Q. And the questionnaire included information about the potential exposure pathways, correct?
A. Yes.
Q. They also administered an x-ray, correct?
A. They did.
Q. And they had those x-rays read by B readers, correct?
A. Right.
Q. And then they also administered pulmonary function tests, correct?
A. Yes.
Q. Okay. Are you aware of whether the pulmonary function tests results were in the Peipens paper?
A. I don't. I'd have to review the paper, I don't remember.
Q. Okay. And one of the takeaways from the Peipens paper was that approximately 17 percent of the screened individuals had pleural abnormalities, correct?
A. Well, yeah, depending on what group we're looking at. They had different percentages.
Q. But I believe if you looked at just the entirety of the population screened, it was approximately 17 percent, correct?

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A. That could be correct.
Q. Eleven hundred eighty-six people, does that sound about right?
A. Well, the Peipens study talked about, I believe it was 9,000-something --
Q. Oh, no.
A. -- people.
Q. I understand. But did they --
MR. LEWIS: I object. You promised this witness you would not interrupt him and you cut him off in his answer.
Q. (By Mr. Stansbury) Did you have anything else to add?
A. Well, no. You threw a number out there that I didn't know where it came from.
Q. Let me put the number into context. They administered x-rays on approximately 6600 people. Does that sound about right to you?
A. That sounds about right.
Q. And I believe 1,186 were found to have pleural abnormalities, correct?
A. I don't remember the number.
Q. Okay. How does the Peipens paper inform any opinions that you may have about pleural disease in Libby?
A. Well, the Peipens paper, I think, pointed out

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that there is a potential -- there is environmental -- or disease caused from environmental exposure to Libby amphibole.

Q. Okay. But that does not --

A. As well as, you know, I mean, basically, the highest rates were in the working population. In their exposure category where they could not identify a pathway, that percentage was 6.7 percent, so that's roughly 3 times higher than what you would expect to find in other types of population-based studies that have been done looking at the prevalence of abnormalities of the lung associated with asbestos.

Q. Okay. That paper, however, did not inform your opinion as to whether pleural disease occurs more quickly in Libby, though, correct?

A. That's probably correct.

Q. Okay. Nor does the Peipens paper inform your opinion as to whether Libby pleural disease was more painful, correct?

A. Correct.

Q. Does it inform your -- does the Peipens paper inform your opinion as to whether pleural disease in Libby is more progressive?

A. Well, I don't know how to answer that question, I guess -- probably not.

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Q. Okay. And it certainly doesn't impact your opinion as to whether pleural disease in Libby was more fatal, correct?

A. No.

Q. Okay. And then you mention Dr. Whitehouse's paper. Which paper was that?

A. Well, he's had several. I've looked at several of his recent publications.

Q. You published one in 2004, correct?

A. Yes.

Q. And you also published a paper in 2008 regarding mesothelioma, correct?

A. Yes.

Q. So the 2004 paper, how did that paper inform your opinions as about pleural disease in Libby?

A. I believe that in -- Dr. Whitehouse's papers describe the disease rates and the effects on pulmonary function, and I believe the 2004 paper talks about the pleural disease rate, but I could be wrong.

Q. Okay. Does it inform your opinion as to whether -- does the Whitehouse 2004 paper inform your opinion as to whether pleural disease occurs more quickly in Libby?

A. I don't remember if that was discussed in the paper or not.

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Q. Okay. Sitting here today, does the 2004 paper in any way inform your understanding as to whether pleural disease in Libby is more painful?

A. No.

Q. Sitting here today, does the 2004 paper in any way inform your opinion as to whether pleural disease in Libby is more progressive?

A. I believe it does, yes. I think that progression is discussed. I don't know if -- I don't remember the specifics of that paper.

Q. So sitting here today, you cannot think of a specific way in which that paper informs your understanding of progression of disease in Libby?

A. I can't remember specifically how it discusses that topic as I sit here today.

Q. Okay. And the 2004 paper by Whitehouse does not inform your opinion about the fatality involved with pleural disease in Libby, correct?

A. Not that I know of.

Q. Okay. You mentioned on a couple of occasions Dr. Black, your conversations with Dr. Black informed your opinions, correct?

A. Yes.

Q. And who is Dr. Black?

A. Dr. Black works in the card clinic up in

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Libby.

Q. What is his role there?

A. I believe he's the director or he runs the card clinic.

Q. Okay, runs the card clinic. And what kind of doctor is Dr. Black?

A. I don't know.

Q. Is he a pulmonologist?

A. I don't know for sure if he's a pulmonologist. I guess I haven't looked at his resume.

Q. Okay. Do you think that's important, what kind of doctor -- a person, a doctor's training, do you think that's relevant to their work as a doctor?

A. I suppose it could be, sure.

Q. Okay. And sitting here today, you're not aware of any pulmonary training Dr. Black has had, correct?

A. No. Like I say, I haven't looked at his resume.

Q. Okay. Were you aware that Dr. Black was trained as a pediatrician?

A. No.

Q. Okay. Do you believe -- okay, so you weren't aware of that.

A. No.

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Q. Okay. And you weren't aware that he worked at St. John's Hospitals -- St. John's Hospital for many years in pediatrics, correct?
A. No.
Q. Okay. You weren't aware that he never did a residency or fellowship in radiology, pulmonary medicine, or occupational medicine, correct?
A. Correct.
Q. Okay. But your conversations with him have informed your opinions about pleural disease in Libby?
A. And what he's seeing in patients that they're screening through the card clinic.
Q. Okay. Again, though, as you said it earlier, you're not a medical professional. Your opinions are based on conversations with Dr. Brad Black in review of the studies that we mentioned earlier, correct?
MR. LEWIS: Objection. This is a summary of his testimony. It's improper, it's compound. And therefore, it's an improper question, and I object to the form of the question.
Q. (By Mr. Stansbury) You may answer.
A. Yeah, in forming my opinions related to the toxicity of the Libby amphibole, I think is what I said is that those are the articles which I've read most recently, but not all of the articles I've read pertaining to

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toxicity of asbestos, including Libby amphibole.
Q. But sitting here today, there's no other article you can think of that informs any opinions you have about any pleural disease in Libby?
A. No.
Q. Okay. Do you have any specific opinions about -- let me back up a second. Are you familiar with the term "diffuse pleural thickening"?
A. Well, I've seen the term.
Q. Do you have any opinions about diffuse pleural thickening?
A. No.
Q. Okay. That's not something you intend to opine about at the confirmation hearing, is it?
A. No.
Q. Okay. And you're not an epidemiologist either, correct?
A. Correct.
Q. You have no education that qualifies you to opine on epidemiology, correct?
A. Correct.
Q. Do you have an opinion on the levels of exposure that cause asbestos-related diseases?
A. Yes.
Q. And what is the basis of that opinion?

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A. Well, the basis of that opinion, again, is my review of the medical literature and scientific journal articles.
Q. Do you believe that epidemiology should be the basis of establishing which exposure levels can cause disease?
A. I do believe that is one part of it, but it certainly isn't the only part of it.
Q. What other parts are there?
A. Well, there are -- basic clinical studies is another part of it, what is being seen in clinics with patients. Some of that may not appear as an epidemiologic study. And, I guess, other types of studies in different types of plants where they're seeing disease rates or mortality rates that may or may not be considered an epidemiologic study are important from an industrial hygiene standpoint.
Q. So your opinions on which exposure levels can cause disease are based in part on case reports of disease cases that have occurred in various locations?
A. In part. That could be part of it, sure.
Q. Do you give greater weight to an epidemiological study than you would to a case report?
A. I think if it's a well-done epidemiologic study it would be given more weight.

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Q. Okay. But your opinion on which exposure levels can cause disease, they're based on your review of literature, correct?
A. And my, yeah, work with asbestos; my 20 or 30 years of an industrial hygienist reading literature.
Q. But as an industrial hygienist, your role is to focus on the actual exposures themselves and preventing those exposures, correct?
A. That's a big part of our job, yes.
Q. Okay. Do industrial hygienists offer opinions in the course of their role as industrial hygienists as to which levels of exposures can cause disease?
A. Well, if they were seeing disease rates within the plant they're working with, I think their information would be important to establishing what the level of exposure can be that causes disease, sure.
Q. But what information would that be?
A. Well, from there, if they're sampling a workplace and they have medical records saying that -- or medical exams showing a certain disease rate in a working population, then, sure, that provides information of exposure that could potentially cause disease.
Q. But is it the -- strike that.
Is it the industrial hygienist, though, who would take those exposure data as well as the medical

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information and reach an opinion as to whether an exposure has caused disease? Is that the industrial hygienist's role?

A. No. The industrial hygienist's role would be to provide that data to people that wanted to simulate it and perhaps do an epidemiologic study.

Q. Okay. So an industrial hygienist is a critical component of developing this epidemiological understanding, correct?

A. Yes.

Q. However, the industrial hygienist is -- strike that.

However, the industrial hygienist's role is to focus on, specifically, the exposure data, correct?

A. Well, for the most part, making sure we collect representative samples that could be used in an epidemiologic study, as well as controlling the exposure.

Q. Industrial hygienists clearly don't do the medical examinations themselves, do they?

A. No.

Q. Industrial hygienists do not determine toxicity based on mortality compared to exposure levels, correct?

A. Correct.

Q. Okay. That's not an industrial hygienist's

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role, is it?

A. No.

Q. Okay. Now, you're also not an expert on insurance issues, are you?

A. No.

Q. You have no opinion as to Grace's historical insurance policies, correct?

A. I guess I don't know what you mean by "historical insurance policies." I --

Q. This is something you know nothing about, correct?

A. Well, other than, I mean, I've certainly read the Grace exhibits where there are memos from the insurance companies, but I don't know what your question is pertaining to.

Q. You have no opinion as to how -- well, strike that. You have no --

MR. LEWIS: We will concede that this witness will not offer any testimony concerning insurance issues in this case.

Q. (By Mr. Stansbury) Okay, let me ask one more follow-up on that. You have no opinion on what constitutes a product for insurance purposes, do you?

A. No.

Q. Okay. Have you reviewed the trust

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distribution procedure in this case?

A. No.

Q. Okay. So you have no opinion on the medical criteria contained in that TDP, do you?

A. No.

Q. And you have not evaluated the exposure treated in that TDP, have you?

A. No.

Q. So you intend to offer no opinions about those issues at the confirmation hearing, correct?

A. No.

Q. Okay. And you are not offering any opinions specific to the objections stated by the Libby claimants, are you?

MR. LEWIS: Objection; lack of foundation. I'm not sure he's seen the objections.

Q. (By Mr. Stansbury) Well, let's establish that. Have you reviewed the objections submitted by the Libby claimants?

A. No.

Q. So you have no opinion on those objections, do you?

A. No.

Q. Okay. Do you have any opinion regarding the amounts paid in settlement to past Libby claimants?

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A. What do you mean do I have an opinion?

Q. Well, I mean do you intend to offer any opinion about the value of past settlements?

A. No.

Q. Okay. Do you intend to offer any opinion about the exposures that any individual Libby claimant may have had?

A. Well, I mean that's what I do is I basically evaluate exposures. So if I was asked to, if I was given information, I guess I could provide an opinion on that.

Q. Right. So if you had information on a person's exposure, you could evaluate that exposure, correct?

A. Yes.

Q. Have you reviewed any of the exposures for any of the Libby claimants?

A. I don't know who they are, so I don't -- I guess I haven't reviewed them.

Q. Okay. So sitting here today, you do not intend to offer any testimony about an individual claimant's exposure, do you?

A. At this time, I guess I haven't seen the claimant, so I don't know what their exposure was.

MR. STANSBURY: Will you mark this as an exhibit, please? Madam court reporter, if you could mark

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that as Exhibit 1, please.
(Document marked Deposition Exhibit No. 1 for identification.)
BY MR. STANSBURY:
Q. Dr. Spear, I'm handing you what's been marked as Exhibit 1, which is the CV of Dr. Terry Spear, and it's dated May 2008. Is this your most recent CV?
A. No.
Q. Okay. When was --
A. I have one with me.
Q. Oh. Could I get that one, please?
A. You bet.
Q. Great.
MR. LEWIS: We're probably going to need some copies. Would this be a good time to take a break?
MR. STANSBURY: Sure, let's take a break.
VIDEOGRAPHER: The time is 9:43. We're off the record.
(A brief recess was taken.)
VIDEOGRAPHER: This is Tape 2 of the videotaped deposition of Dr. Terry Spear.
The time is 9:49. We're on the record.
MR. STANSBURY: Okay. And so do we have -- actually, let's make this Exhibit 2.
MS. ROHRHOFER: Oh, really? Okay.

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MR. STANSBURY: Yeah, because we still have the old exhibit, we have the old CV as Exhibit 1.
(Document marked Deposition Exhibit No. 2 for identification.)
BY MR. STANSBURY:
Q. So I'm handing you what is marked as Exhibit 2, which is your June 2009 CV.
A. I'm confused.
Q. There was, the May one was 1. That one was 1.
A. This is marked 1 but it's 2009.
Q. Yeah, we're not going to use old one. We're not going to use the old one. We're going to use the new one instead.
(Off-the-record discussion.)
BY MR. STANSBURY:
Q. So you have a -- according to your CV, your BA is in microbiology, correct?
A. Yes.
Q. You have a master's in environmental health, correct?
A. Yes.
Q. And then a Ph.D. in environmental health from the University of Minnesota, correct?
A. Yes.
Q. Okay. And in your CV under "Related

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Professional Experience," tell me if I read this correctly. It's on the second page (quoted as read):
"Provide consultation to a variety of general industry and mining companies on program document development, health and safety compliance auditing, regulatory issues, industrial hygiene field sampling, on-site hazard assessment, and training. Over 20 years of experience providing expert witness testimony involving consultation and participation in more than 50 personal injury and illness liability litigation cases for plaintiffs, defendants, private industry, and insurance companies."
Did I read that correctly, sir?
A. Yes.
Q. Okay. I want to focus on the expert witness testimony. You list here: Plaintiffs, defendants, private industry, and insurance companies.
You were also retained as an expert witness by the U.S. Government at one time, correct?
A. Yes.
Q. And that was in connection with what?
A. The criminal trial?
Q. Yes. When were you retained by the U.S. Government?
A. I believe it was sometime in 2005.

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Q. Do you recall if it was winter or spring or summer?
A. Not really. I believe, I believe it was sometime in 2005 when I was -- when I first started doing work in that issue. I may have been contacted before that. I don't remember the chronology.
Q. Who is the, which -- do you remember who the -- well, strike that.
Who was the first person you recall contacting you from the U.S. Government?
A. Kris McLean.
Q. And who is Kris McLean?
A. He's the district attorney out of Missoula.
Q. And what did he ask you?
A. He asked me if I'd be interested in discussing participating in the criminal trial.
Q. Okay. And was this over the phone, this first conversation?
A. Yes.
Q. Was it a substantive call or was it just a "hi", get to know each other, followed up by a later meeting?
A. It was just, yeah, that type of call.
Q. Okay. When did you first meet -- was the next meeting with Mr. McLean face to face?

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A. Yes.
Q. When did that occur, do you recall?
A. Again, I believe it would have been in 2005.
Q. Okay.
A. I don't recall exactly when.
Q. Okay. And could you briefly summarize that first face-to-face meeting with Mr. McLean?
A. Well, I believe they presented me with the allegations in the trial proceedings and we discussed those. And I believe he asked me if I would be willing to be a witness on, I think -- originally, it was on two of those aspects.
Q. Which two aspects?
A. I believe, you know, one pertained to sanitation. I don't remember -- both of them pertained to similar things, but -- (pause.)
Q. So one was sanitation and the other one?
A. I don't remember.
Q. But it related to the historical operation of the mine and mill up in Libby?
A. Yes, I think that would be fair.
Q. Okay. Did you talk to him at all about any of your work regarding the forests around Libby?
A. Well, no, because at that time, we'd just begun that work in late '03 and we hadn't published

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anything on that.
Q. Did you tell him that was ongoing?
A. Well, not then --
Q. Okay.
A. -- because it wasn't really ongoing.
Q. Gotcha.
A. I mean it was discussed and we were planning things. We hadn't published anything. I notified him after we had a publication.
Q. Okay. And so obviously, you agreed to serve as an expert witness for the Government, correct?
A. Yes.
Q. And were you paid for your services?
A. Yes.
Q. What was the paying rate?
A. I believe $150 an hour.
Q. And what specific services did you provide for the U.S. Government?
A. I provided Mr. McLean with an opinion.
Q. In the form of a written report?
A. Yes.
Q. Okay. And this written report commented on the historical vermiculite mining and milling operation in Libby, correct?
A. I believe it did.

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Q. And you also offered opinions about what the industrial hygiene standards were at various times during that operation, correct?
A. And I don't remember if we -- if that was part of the opinion. I mean, certainly, it was on standards pertaining to how do we keep materials from leaving the workplace and getting its way into the home.
Q. Right. But you also were of the opinion that W.R. Grace had failed to comply with the industrial hygiene standards that were in place at that time, correct?
A. Yes.
Q. Okay. What were some of the areas where you found W.R. Grace to be lacking?
A. Well, No. 1, lack of informing the worker of the hazards of the materials, Libby amphibole that they were working with --
Q. Right.
A. -- lack of control of the dust, whether it be engineering controls, administrative controls, or personal protective equipment; lack of sanitation or control of dispersion and taking this material home. That's, that was the main part of it.
Q. Okay. Did you meet with anybody else from the U.S. Government other than Mr. McLean?

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A. Well, when we had the first meeting, they came over to Montana Tech and there were two other individuals that worked for the EPA, and I don't remember who they were.
Q. But they were EPA individuals?
A. That's what I understand.
Q. Okay. How many times did you meet with Mr. McLean?
A. Just once.
Q. Okay. And then you submitted a report. Did you have any other conversations with him over the phone?
A. I believe we had other phone conversations, just keeping me updated on -- at least initially, like 2005, maybe part of 2006.
Q. Okay. What about 2008 - 2009? Did you continue a dialogue with Mr. McLean?
A. No. The only dialogue would be if we had a publication, I wanted to make sure that there was no conflict of interest in his eyes, so I would send him the fact that we had a paper published pertaining to Libby and just to let him know.
Q. So you informed Mr. McLean about these various forest studies that you were doing, correct?
A. Yes.
Q. And you also informed the publications that

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you were working with the U.S. Government at the time?
A. I'm sorry, I lost that one.
Q. Oh. So you mentioned you were concerned about a conflict of interest with the Government and you disclosed to the Government that you were writing these papers, correct?
A. Yes.
Q. Did you make a disclosure in the other direction as well to these papers that you were testifying for the U.S. Government?
A. I didn't.
Q. Okay. And just so we're clear, this is -- we're talking about an article in 2006 that was submitted to the International Journal for Scientific Research Into the Environment and its Relationship with Human Kind, right? Is that your 2006 article? You might have it in front of you.
A. This is what you're referring to?
Q. May I see?
A. (Handing document to counsel.)
MR. STANSBURY: Could we mark this as an exhibit, please?
(Document marked Deposition Exhibit No. 3 for identification.)
BY MR. STANSBURY:

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Q. So we're looking at "Trees as reservoirs for amphibole fibers in Libby, Montana," published 2006. And the authors are Tony Ward, Terry Spear, Julie Hart, Curtis Noonan, Andrij Holian --
A. Yeah.
Q. -- okay, Myron Getman, and James Webber. Did I read that correctly, sir?
A. Yes.
Q. Okay. And this article - we can discuss it in detail a little bit later, but just so I'm clear - this article, you examined tree bark to determine the asbestos contents in that tree bark, correct?
A. Yes.
Q. Okay. And at the time of this article's publication, you were working as a consultant to the U.S. Government in connection with the criminal case, correct?
A. Yes.
Q. Had you also be retained by individuals who had lawsuits against W.R. Grace for personal injury arising from exposures in and around the mine?
A. At that time, I don't believe so.
Q. Okay. Do you recall -- you had testified previously, though, on behalf of plaintiffs, correct?
A. I have, yes.
Q. When was the last time you had testified on

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behalf of a plaintiff in a Libby case?
A. I guess -- I don't remember. It could have been the mid 2000s. I don't remember the last time I testified.
Q. Okay. When were you retained in connection with this case?
A. I believe it was 2008.
Q. 2008. So you had testified in the mid 2000s, as you said, on behalf of individuals exposed to asbestos from Libby, correct?
A. To the best of my memory.
Q. Okay. And at this time, you were working as a consultant for the U.S. Government in a criminal trial against W.R. Grace involving alleged criminal releases of asbestos into the ambient air, correct?
A. Well, again, takehome exposure is what I was asked to testify on.
Q. Okay.
A. My testimony, as I understand it, for Kris McLean was to basically evaluate how they could have controlled asbestos takehome with sanitation procedures.
Q. And do you have your 2007 article in front of you, sir, in your folder?
A. Is this the firewood harvesting?
Q. Yes, sir.

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A. Yes.
MR. STANSBURY: Okay. Could we mark that as an exhibit, please, madam court reporter?
(Document marked Deposition Exhibit No. 4 for identification.)
BY MR. STANSBURY:
Q. Exhibit 4 is "Evaluation of Asbestos Exposures during Firewood-Harvesting Simulations in Libby, Montana, USA - Preliminary Data", by Julie Hart, Tony Ward, Terry M. Spear, Kelly Crispen, and Tara R. Zolnikov.
Did I read that correctly, sir?
A. Yes.
Q. And this is published in the "Annals of Occupational Hygiene" in 2007. Is that correct, sir?
A. Yes.
Q. Okay. And in this paper, you're looking at activities that could occur in the forest and potential asbestos exposures that could arise from those activities, correct?
A. Well, specifically from harvesting firewood, yes.
Q. Okay. Can I get the 2009 -- do you also have the 2009 paper in front of you, sir?
A. I don't.
(Document marked Deposition

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Exhibit No. 5 for identification.)
BY MR. STANSBURY:
Q. I'm handing you what has been marked as Exhibit 5. Okay. I've handed you what has been marked as Exhibit 5, which is "Fate of Libby Amphobile Fibers When Burning Contaminated Firewood," by Tony Ward, Julie Hart, Terry Spear, Brienne Meyer, and James Webber, published in 2009 in "Environmental Science Technology".
Is that correct, sir?
A. Yes.
Q. Okay. And this article examined potential asbestos exposures that could occur when using wood as firewood in an indoor heating oven, correct?
A. Yeah, I don't know if it evaluated exposures. We were mainly trying to determine if wood that was contaminated with the asbestos was burned, where would it end up, I mean where did it go.
Q. Okay. So this was not aimed at looking at potential exposures.
A. Well, not -- no, because we didn't really concentrate on doing an exposure measurement. It was mainly just sampling within the stove itself.
Q. Okay. The 2007 paper, however, you are looking at, Exhibit 4, you are looking at potential exposures, correct?

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A. Yes.
Q. Okay. Did you ever talk about this paper with Kris McLean?
A. No.
Q. Okay. Did you ever talk about the 2009 paper with Kris McLean?
A. No.
Q. But you did discuss Exhibit 3, which was the 2006 paper, you discussed that with Kris McLean?
A. No.
Q. Oh, you never discussed any of these with Kris McLean?
A. No. I basically would notify him of what we were trying to publish and that we were doing research up in Libby.
Q. So you made him aware that you were doing this research, though, correct?
A. Yes.
Q. Okay. And the 2009 paper, you say it does not focus on potential exposures, correct?
A. Well, not -- that wasn't the main aim of the study. It was to determine where are the fibers when you burn wood contaminated with the amphobile asbestos. Do they go out the stack? Do they go -- stay in the ductwork? Do they stay in the ash?

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Q. Was your concern that potentially people could be exposed to asbestos when burning firewood?
A. I believe that would be fair, that there could be a potential concern.
Q. Okay. And with Exhibit 4, the 2007 paper, there was a concern that there could be exposure to asbestos in the harvesting of firewood, correct?
A. Yes.
Q. Okay. Exposure in the ambient air, correct -- well, strike that.
This would be airborne exposures that arise from activities involved with harvesting firewood, correct?
A. Yes.
Q. Okay. And those could potentially cause disease, correct?
A. I suppose that's correct, yes.
Q. Right. That's your concern is preventing disease, correct?
A. Yes.
Q. And so with the 2006 paper, Exhibit 3; the 2007 paper, Exhibit 4; the 2009 paper, Exhibit 5; when submitting these papers, you did not disclose to any of the publications that you were testifying as -- strike that.
With respect to Exhibit 3, the 2006 paper; Exhibit

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4, the 2007 paper; and 2009, the -- which is Exhibit 5, the 2009 paper, you did not disclose to the journals that you had been retained as an expert by the U.S. Government?
A. I didn't.
Q. Okay. Did you disclose to any of the journals that you had previously testified on behalf of Libby claimants?
A. No.
Q. Did you disclose to any of the journals about your retention in this matter here?
A. I didn't. I wasn't -- well, no. I wasn't retained for this case until 2008 so -- (pause.)
Q. But for the 2009 paper, Exhibit 5, this was published after you were retained, correct?
A. Yes.
Q. Okay. Why didn't you feel it was necessary to disclose that information to the journals?
A. Well, because we are doing research to determine pathways of exposure. And it's not being paid for by any law firm, and I'm not doing it for a law firm. I'm doing it as a research exercise to try to determine pathways of exposure.
Q. But this work is relevant to your opinions in this case, correct?
A. I think all the work I've done in Libby before

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these publications is relevant, yes.
Q. Okay. So, for example, the 2007 paper, in your mind, this paper could be used to support an opinion that individuals in Libby could develop disease from harvesting lumber, correct?
A. I suppose it could be.
Q. Okay. "Yes" or "no," sir? Do you agree that that's true?
A. Yes.
Q. Okay. And presumably, this could be an individual who is a Libby claimant, correct? Are you aware of any Libby claimants who may have been exposed in the forest?
A. I've never been involved with a court case that involved forestry or exposure to firewood, no.
Q. Okay. Are you aware of any disease that's arisen from exposure to forestry or firewood?
A. I'm not. I haven't seen any data on that.
Q. Okay. So sitting here today, you have no opinion as to whether exposures in the woods at Libby could cause disease?
A. Well, again, I'm not a doctor and I don't want to state an opinion as to if our research is saying that -- we don't say that in the research that it could cause a disease. We basically say that there could be exposures

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and perhaps it would lead to a concern for disease.
Q. Okay. Well, let's narrow this down a bit, because earlier we were talking, I'd asked you about whether you had opinions as to what exposure levels could cause disease. And you said that you did, correct?
A. Yes.
Q. Okay. And that was based in part on your review of epidemiological literature, correct?
A. In part, yes.
Q. As well as case reports, correct?
A. Yes.
Q. Okay. Do you have an opinion as to whether the exposures identified in Exhibit 4 can cause disease?
A. And Exhibit 4 --
Q. Yes.
A. -- is the firewood harvesting?
Q. Yes, sir.
A. Yeah, I mean we wanted to determine if -- we knew the wood was contaminated, so we wanted to determine can we liberate fibers if we do this activity. So based on the personal breathing zone samples, we, you know, we found that fibers are liberated.
Q. Okay. And were they liberated at a level that you believe could pose a threat to human health?
A. Well, since -- particularly for Libby

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amphibole, I'm not sure we know what level, lowest level was going to cause disease, then I guess any level would concern me.
Q. Okay. And so this research, the 2007 paper, just so we're clear, who paid for that research?
A. Which one again?
Q. The 2007, Exhibit 4, the harvesting study.
A. This was paid for through the University of Utah, I believe.
Q. Okay.
A. And it wasn't mine. It was Julie Hart's research. It was her grant.
Q. Did you ever send a copy of this to Kris McLean?
A. I don't remember if I did or not. I may very well have. I just wanted to keep him informed that we were doing the work up in Libby.
Q. Okay. So you're doing the work in Libby, establishing these exposures. And then today, you're offering testimony about potential exposures that could be occurring in Libby that could cause disease, correct?
A. Yes.
Q. And a basis of that opinion is, in part, the studies, correct?
A. Well, I rely on these studies, yes.

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Q. Okay. And you're being compensated for being here today, correct?
A. Yes.
Q. What is your -- is your hourly rate still $150 an hour?
A. Yes.
Q. Okay. So you did these studies that were published in 2006, 2007, and 2009 without disclosing that you had previously testified on behalf of individuals who got disease from Libby, correct?
MR. LEWIS: Objection. Disclosing to who?
MR. STANSBURY: To -- fair point.
MR. LEWIS: Okay.
Q. (By Mr. Stansbury) To the journal, correct? To either -- any of the journals, correct?
A. I did not disclose it to the journal, but I wasn't the grant administrator, either.
Q. But you are one of the authors listed, correct?
A. Yes.
Q. Okay. And then today, you are being compensated to offer opinions that are based in part on this research you've previously done, correct?
A. Yes.
Q. Okay. And in particular, and with respect to

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the 2009 paper, you were retained in this case when that paper was being considered for publication, correct?
A. Yes. It was being considered in 2008.
Q. Okay. And you at no point disclosed to the journal that you were receiving compensation to offer opinions about exposures in the same forest that were the subject of that paper?
A. No.
Q. Okay. Did you review the guidelines for disclosing conflicts of interest before submitting any of those three papers?
A. Well, I didn't. I basically helped put the papers together, and I think Tony Ward and Julie Hart submitted them, so -- (pause.)
Q. Okay. Did you disclose to them that you had been working for -- you had historically worked for plaintiffs?
A. Yes. They know that I have been.
Q. Okay. And they knew that you were working for the U.S. Government?
A. I don't know if they knew that or not. I believe so.
Q. But they certainly knew that you were involved with personal injury cases involving exposures in Libby, correct?

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A. I believe they knew that.
Q. But there was no disclosure made?
A. Not that I know of.
Q. Okay. I would like to look -- do you have your expert report with you today, sir?
A. Yes.
MR. STANSBURY: Could we mark that as an exhibit, please.
MR. LEWIS: I've got one. What exhibit number are you going to put on it?
(Document marked Deposition Exhibit No. 6 for identification.)
MR. LEWIS: Maybe I'll take this other, the other copy.
BY MR. STANSBURY:
Q. Before you is Exhibit 6. Is this your expert report, sir?
A. Yes.
Q. Okay. And does this opinion reflect the entirety of the opinions you intend to offer at the confirmation hearing?
A. Yes.
Q. Okay. Has there been any work done since the submission of this report that you believe informs the opinions that you wish to offer in this case?

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A. No.
Q. Okay. It's a pretty long report. Let's see here, it's 27 pages; is that right?
A. I believe that's like 32 counting references.
Q. Okay, counting references, okay. And the paragraphs are numbered, correct?
A. Yes.
Q. And some of these paragraphs deal with related points and some of them deal with very different points, correct?
A. That would be fair, I think.
Q. Okay. What I'd like to do is kind of walk through the report so we can kind of identify which paragraphs relate to specific opinions you intend to offer at the hearing. And to the extent that we can kind of group of the paragraphs together, perhaps we could do so. Would you be willing to walk through that with me?
A. Sure.
Q. Okay. Now, Paragraph 1, your name and where you live, I think we can move past that. And 2 and 3 are background information. Paragraphs 4 and 5, these paragraphs both relate to the published studies we were just discussing, correct?
A. Yes.
Q. Paragraph 4 relates to Exhibit 3, whereas

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Paragraph 5 relates to Exhibit 4. Correct, sir?
A. Yes.
Q. Okay. And there's no reference in this report to Exhibit 5, the 2009 paper. That was published after this report, correct?
A. Yes.
Q. But do you intend to offer any opinions at the confirmation hearing based on that paper?
A. No.
Q. Okay. So we can just put that aside, then, and not talk about it, correct?
A. Fine.
Q. Okay. Now, looking at Paragraph 6, Paragraph 6 and 7, these discuss - and if you don't like my clarification, please tell me - these discuss the historical conditions at the mining and milling facility, correct, sir?
A. Well, yeah. It discusses, you know, the basic flow of operations, flow of materials. And to that extent, I think you're correct.
Q. Okay. Well, let's agree to a term that we can both be comfortable with. Paragraph 6 and 7 both relate to the historical operating conditions at Libby? Is that --
A. Yes, again --

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Q. Okay.
A. -- the way things were processed.
Q. Okay.
A. And what --
Q. So those were the historical conditions. Paragraph 8, tell me if I read this correctly:
"The community of Libby lies in a mountain valley. The valley air shed functions somewhat like a bowl. Pollutants when disturbed by wind or human activity tend to be recycled into the bowl."
Did I read that correctly, sir?
A. Yes.
Q. Okay. That opinion relates to the atmospheric conditions in Libby, correct?
A. Yes.
Q. Okay. Outdoor, right?
A. Yes.
Q. Ambient air, is that another term for that as well?
A. Yes, it could, I guess.
Q. Okay. Do industrial hygienists typically study the ambient air?
A. Well, the industrial hygienist is primarily concerned with what goes on inside the plant, but certainly we do become involved with public exposure

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because materials do move outside the plant. And so from that standpoint, I wouldn't be quite that narrow.
Q. Okay. So when you say moving outside the plant, do you mean, you know, a cloud of dust moving down the street, or does that also involve atmospheric conditions, you know, thousands of feet in all directions?
A. Well, probably not. I mean we certainly have to record, you know, atmospheric conditions when we're doing sampling. We want to know wind speeds and wind directions and pressures, temperatures, and things like that. So that's all atmospheric, I guess.
Q. Okay. And the statement, "The valley airshed functions somewhat like a bowl," what is your basis for that opinion?
A. Well, the basis for it is that there are a lot of inversions in Libby, I mean if you've ever been up there in the wintertime.
Q. Oh, I have.
A. And so it tends to have -- you know, the air tends to settle within the valley.
Q. Okay.
A. That's all I meant there.
Q. Okay. Have you ever studied systematically the extent to which any type of particulate or pollutant would remain static in the Libby atmosphere compared to

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the atmosphere of other areas?
A. I haven't personally, no.
Q. Okay. Have you reviewed any literature which has studied the Libby atmosphere in that manner?
THE WITNESS: As compared -- excuse me, Counsel. I don't mean to interfere, but when you say "in that manner," are you saying as compared to some other place?
MR. STANSBURY: Yes.
MR. LEWIS: Okay.
THE WITNESS: Well, yes, I have looked at literature describing that comparison.
Q. (By Mr. Stansbury) Can you name any of the literature which --
A. Well, I -- let me -- I guess maybe I better clarify. I mean I've looked at the literature that Tony Ward has put together where he looks at source apportionment; in other words, what's contributing to the particulates in the air in Libby. Is it automobile exhaust? Wood smoke? So from that standpoint, I've looked at that type of literature.
Q. Is that a published paper?
A. I don't know if it's published or not.
Q. Okay.
A. I believe it is.

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Q. But that's something that informs your opinion as to whether the airshed functions somewhat like a bowl. It was Tony Ward's work, correct?
A. Well, in part, yeah.
Q. In part. Did that work examine asbestos in particular?
A. Not that I'm aware.
Q. Okay. It focused on, I think you mentioned, automobile exhaust. Is that one of the potential substances?
A. I believe so, wood smoke, and there were other things that they looked at.
Q. Okay. But you've not looked at any literature specific to how asbestos either remained or does not remain in the atmosphere in Libby, have you?
A. Well, I've obviously looked at current studies being done by EPA as the technical advisor to the TAG. That's my job, is to, you know, evaluate what EPA is doing up there and to try to find out if, you know, if there's any problems with that. And so I do read their reports. I've read their ambient air sampling reports and different things.
Q. Okay. None of those reports, though, are cited in this, in this expert report, though, right?
A. No.

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Q. Okay. Nor is the Tony Ward article, correct?
A. Correct.
Q. Okay. And so when it says pollutants when disturbed by wind or human activity tend to be recycled in the bowl, that opinion is based also on Tony Ward's work as well as the EPA's work?
A. Well, yes, in part, and just having been up there and just seeing how stagnant the air can be. So, I mean, that's the word "recycle." It's not going to move out of there very readily.
Q. When you say just seeing the air, is that something that I would be just as capable of observing as you would, the stagnant air?
A. Yes.
Q. Okay. That's not something that's based on an expertise that you have, correct?
A. No.
Q. Okay. Let's look at Paragraph 9, sir. Paragraph 9, and actually, I believe Paragraph 9, 10, and 11, these paragraphs all seem to discuss ways in which people in the community may have been exposed to asbestos from the mining and milling facility; is that correct, sir?
A. I believe that that would be correct in part, yes.

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Q. Okay. So is it fair to say that these three paragraphs, 9, 10, and 11, they deal with potential community exposures?
A. Yes.
Q. Okay. Paragraph 12: Various tests on the dust showed 27 to 40 percent asbestos. You cite to common exhibits, correct?
A. Yes, common exhibits and, I mean, the percentages are also listed in, you know, publications like by EPA or ATSDR.
Q. But these are historical measurements, correct? These weren't measurements that were done recently, correct?
A. I believe they're historical.
Q. Okay. And so they reflect the historical conditions that existed when the mine and the mill was operating, correct?
A. Well, I'm not, I'm not sure how to answer your question. I mean the percentages, I don't know if they've changed. If they have, I don't know it.
Q. Okay, okay.
A. But, yeah, these do come from people looking historically at what's being reported.
Q. Those were the conditions historically. Historically, 27 to 40 percent of the dust showed some asbestos in it, correct?
A. Yes.
Q. Okay. Let's turn to Paragraph 13. Now, Paragraph 13, you're talking about the industrial hygiene literature, correct?
A. Yes.
Q. And specifically, the literature is understanding of asbestos, correct?
A. Yes.
Q. And you also mention that, and if I say this correctly: "The above was clear in the occupational medicine and industrial hygiene literature, and W.R. Grace and its predecessor Zonolite Company should have been well aware of it."
Correct?
A. Yes.
Q. Okay. So this one, it's not necessarily just historical conditions. We're also kind of talking here about what W.R. Grace or Zonolite should have known at the time, correct?
A. Yes.
Q. And the way a company knows things, so to speak, is a function of its decision to gather information, correct?
A. Yes.

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Q. And that's an important part of being a responsible company in your mind, correct?
A. Well, that's one way.
Q. One way.
A. Obviously, the other way is that someone gives them information --
Q. Okay.
A. -- and provides information to them.
Q. But a company informing itself of potential hazards, that's part of a responsible company's code of conduct, correct?
A. Please say that again.
Q. Sure. A company informing themselves of potential hazards involving their enterprise, that is part of a responsible company's code of conduct, correct?
MR. LEWIS: I'm going to object as -- I think the term "code of conduct" is vague. Without showing what you mean by that, I don't know how the witness can answer the question. I think the question is vague.
Q. (By Mr. Stansbury) Do you understand my question, sir?
A. No.
Q. Okay. You believe that companies can act responsible?
A. I hope that they do, yes.

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Q. You believe companies can act irresponsibly, don't you?
A. Yes.
Q. It's your opinion that Grace acted irresponsibly for many years with respect to the mining and milling operation in Libby, correct?
A. Yes.
Q. Do you consider that irresponsibility to be a course of conduct that Grace took?
A. I don't know what you mean by "course of conduct."
Q. Do you -- well, we can come to an agreement on whatever words you want to use here. What I'm trying to get across, though, is this opinion - and there's going to be a lot of opinions in this report - really talks about what Grace should have known, correct?
A. Yes.
Q. What they should have done, correct?
A. Yes.
Q. What they didn't do, correct?
A. Yes.
Q. Is there any way you would term -- is there any term you would use to describe those issues? I'm open to whatever term you want to use.
A. Well, that's fine. We just mentioned them

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individually, so --
Q. Okay. So, but they're actions, I mean these are all actions or inactions by Grace, correct?
A. Yes.
Q. Okay. And can we use the term "conduct"? I mean is the term "conduct" comfortable to say that somebody's conduct is responsible when they put in a medical surveillance program? That's a form of conduct that's responsible, correct?
A. That would be fine.
Q. Okay. And, you know, not making any effort to keep a facility clean, that's irresponsible conduct, correct?
A. Yes.
Q. And so I'm not trying to -- you know, I like the word "conduct" because it's easy. I just want to make sure we're on the same page here.
Paragraph 13 talks about Grace's failure to -- or states what they should have known. And one way a company knows something is by informing itself, either somebody telling them or, you know, taking affirmative steps to learn, correct?
MR. LEWIS: Objection; that's a compound question and it's improper.
Q. (By Mr. Stansbury) Do you understand the

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question, sir?
A. Well, yes. And by informing themselves meaning, you know, searching the literature for what's known about a particular topic like asbestos, conducting studies which are published and get the word out.
Q. Right.
A. Yeah, that's conduct.
Q. Okay. So that's what Paragraph 13 -- Paragraph 13, you know, addresses that. Paragraph 14, I'm going to read this out loud (quoted as read):
"The central principles of industrial hygiene literature are to study, to warn and to protect. These principles extend not only to Grace workers in Libby, but also to family members of workers, and to the community. W.R. Grace and its predecessor Zonolite Company did not adequately study, warn or protect the workers, their families, or the community of Libby."
Did I read that correctly, sir?
A. Yes.
Q. Okay. Again, this is an example where you believe Grace's conduct was improper with respect to the workers, the family members, and the community of Libby correct, sir?
A. Yes.
Q. Okay. Paragraph 15, this one's a little bit

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longer. But again, is it fair to say, and this is -- you know, because you actually are quoting, I believe, Earl Lovick's deposition testimony, correct, from the Schnetter v. W.R. Grace transcript?
MR. LEWIS: Objection; that's not correct.
THE WITNESS: Well, are we on 15?
MR. LEWIS: That's his trial testimony.
MR. STANSBURY: Oh, excuse me. Thank you, Tom, I appreciate that.
Q. (By Mr. Stansbury) Paragraph 15 runs onto page 7 all the way to page 8, correct?
A. Fifteen, yes.
Q. Okay. And once again, here you are examining what Grace knew about the conditions in Libby. And as you state in the last sentence of the paragraph: "Grace continues to send men into the dry mill for eight years after 1966."
Is that correct, sir?
A. Yes.
Q. So again, this speaks to Grace's, in your mind, improper conduct during this time period, correct, sir?
A. Yes.
Q. Okay. Moving on to Paragraph 16: "Grace knew of the connection between asbestos exposure and lung

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cancer through the 1964 State Report, and was therein informed of 'possible widespread carcinogenic air pollution'" - citation to Exhibit 53 - "Risks of asbestos to community members were quite clearly spelled out to Grace executives in 1968," again citing Exhibit 119.

So here you believe that Grace was aware that there were community risks, correct?

A. Yes.

Q. And Grace, in your mind, was not warning people about these risks, correct?

A. That's correct.

Q. So again, not proper conduct for a company like Grace, correct?

A. That's correct.

Q. Okay. Paragraph 17, this to me looks more like discussions of the historical operations at Libby. Is that a fair description of Paragraph 17?

A. Yes, the date 1967.

Q. Right. And you're talking about the test was done in a large "600 fan" of the dry mill. So this doesn't necessarily speak to their conduct, but again as we were discussing earlier, speaks to what the conditions were historically, correct, sir?

A. Well, it -- you know, if you read between the lines, it speaks of their conduct, too, because it was

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right in this time frame that the stack on the dry mill was horizontally located, so -- (pause.)

Q. Okay. So, again, in your mind, this is part of the conduct, then. You would put this under, again, another example where Grace's conduct was improper.

A. Yes.

Q. Okay, that's fair. Paragraph 18, here you're looking at - and I'm going to read this out, tell me if I read this correctly:

"Residents have reported that Libby in 1950-1990 was a dusty place. The manager of Grace operations estimated in 1965 that 'you could get a five count in downtown Libby on many dry days.'" Exhibit 79.

This would have been 5 -- and could you please explain what "mppcf" means so we're clear?

A. Million particles per cubic foot.

Q. -- "or about 20 fibers per cubic centimeter." See Amandus (1987), citing Libby studies, expert report of Dr. Alan C. Whitehouse.

"In 1975, Grace performed measurements of ambient air at three locations in Libby and obtained 0.67, 1.1, and 1.5 f./cc" -- which is fibers per cubic centimeter. Is that correct, sir?

A. Yes.

Q. -- "indicating a serious hazard from breathing

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the air in Libby," Exhibit 20, expert report of Dr. Whitehouse.

Now, this paragraph speaks more to potential community exposures, correct, sir?

A. Yes.

Q. Okay. Let's look at Paragraph 19. Again, I believe this paragraph speaks to Grace's conduct at the time, the last sentence being: "Accordingly, Grace's medical surveillance program was inadequate at all times up to 1990."

Do you agree, sir?

A. Yes.

Q. Okay. Paragraph 20, again, this is -- does this deal with Grace's conduct?

A. Yes.

Q. Okay. Paragraph 21, same question: Does this deal with Grace's conduct?

A. (Perusing document) -- yes.

Q. Paragraph 22, does this pertain to Grace's conduct?

A. (Perusing document) -- yes.

Q. Paragraph 23, does this relate to Grace's conduct?

A. (Perusing document) -- yes.

Q. Paragraph 24, does this relate to Grace's

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conduct?

A. (Perusing document) -- well, it pertains to their conduct and -- their conduct, and, you know, their knowledge.

Q. Okay. And the knowledge that either informed or perhaps did not inform the conduct they took, correct?

A. Yeah, their knowledge of what was going on within their own plant.

Q. Right. And as you say, Grace settled the case, correct?

A. Where do I say that at -- yes, okay.

Q. That's correct?

A. Yes.

Q. So that was the course of conduct they took was to settle the case, correct?

A. Yes. In part, I believe that would be correct.

Q. Okay. Paragraph 25, and I believe this relates to a study of workers. And again, you state: "This study was not disclosed." Is that correct?

A. Yes.

Q. And does that relate to Grace's conduct at the time?

A. Yes, and state of the knowledge.

Q. And state of knowledge. Paragraph 26, this is

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a study of hamsters which, as you state, was not disclosed. Does this relate to Grace's conduct and knowledge at the time?
A. Yes.
Q. Okay. Paragraph 27, again, does this relate to Grace's conduct?
A. Yes.
Q. I'd like to read Paragraph 27 for the record. Tell me if I read this correctly, please.
"In 1980 NIOSH proposed a study on Libby workers. Grace's response was to consider alternatives, including to 'obstruct and block'" - "obstruct and block" in quotes - "the study."
Did I read that correctly, sir?
A. Yes.
Q. Now, ultimately, though, Grace cooperated with NIOSH, didn't they?
A. Yes.
Q. And that study --
A. Well, eventually NIOSH came into the plan, sure.
Q. Right. However eventually, this proposed study became the Amandus study, correct?
A. Yes.
Q. Okay. But you don't mention that below, do

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you?
A. No.
Q. Okay. Paragraph 28, again, does this relate to Grace's conduct, historical conduct?
A. (Perusing document) -- yes.
Q. Okay. Paragraph 28 -- excuse me, Paragraph 29, does this relate to Grace's historical conduct?
A. (Perusing document) -- it relates to their conduct, yes.
Q. Okay. Paragraph 30, does this relate to Grace's historical conduct?
A. (Perusing document) -- yes. And in addition to relating to their conduct, it relates to, you know, what is done in the field of industrial hygiene, so just so we're clear on that.
Q. Okay. No, that's fair. But what is done in the field of industrial hygiene is, particularly at that time, is certainly a relevant consideration when evaluating their conduct, correct, sir?
A. Yes.
Q. Okay. Paragraph 31, once again, does this relate to Grace's historical conduct?
A. (Perusing document) -- yes.
Q. Okay. Paragraph 32, does this relate to Grace's historical conduct?

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A. (Perusing document) -- yes.
Q. Now, Paragraph 33, this discusses the -- how would you characterize Paragraph 33?
A. Let me read it. May I?
Q. Please do.
A. (Perusing document) -- it certainly pertains to their knowledge.
Q. Ultimately -- okay, so it pertains to their knowledge. So you would say -- or is it fair to say this provides just background on the natural conditions in the Libby area?
A. Well, it pertains to their conduct, too --
Q. Okay.
A. -- because they're actually trying to market this stuff.
Q. Fair, okay. And Paragraph 34, I'll read this for the record (quoted as read):
"Grace knowingly endangered the health of workers, family members of workers and community members in Libby for decades. This constituted gross violations of applicable industrial hygiene standards."
Did I read that correctly, sir?
A. Yes.
Q. And that, of course, relates to their conduct, does it not?

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A. Yes.
Q. The term "knowingly endangered," is that a term that's often used in industrial hygiene?
A. Well, "knowingly" -- I mean they endangered and they knew what was in this material, so they knowingly endangered these people.
Q. Is that an opinion that you shared with Kris McLean, that they had knowingly endangered these people?
A. I don't know if it was or not.
Q. Okay. Okay, Paragraph 35, is it fair to say that this paragraph speaks generally about the history of the medical community's understanding of asbestos disease?
A. Yes.
Q. This is in no way specific to Grace, correct?
A. It speaks to the historical knowledge of.
Q. So arguably, this could be something which could be used to evaluate their conduct because of what they could have historically known, correct?
A. Yes.
Q. Okay. Paragraph 36, this paragraph speaks to the, I would say, mineralogical content of the Libby amphibole; is that correct?
A. Yes, and also knowledge about the toxicity of at least part of that amphibole.
Q. "The Montana Supreme Court has found asbestos

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dust was a well known toxic inhalant prior to 1956." Is that the portion that you say speaks to toxicity?
A. Which paragraph are you on again?
Q. Sure, 36, I'm reading in the middle of the paragraph.
A. Oh, okay. Yeah, and the reference to Vorwald.
Q. What is Vorwald?
A. Vorwald essentially performed some toxicological studies on tremolite.
Q. However, our understanding of the toxicity of tremolite today is more informed by studies performed by individuals such as Amandus, McDonald, Sullivan, or Lockey, correct?
A. Well, considering the fact that we are looking at the different forms of amphibole in there, yes.
Q. Okay. So this paragraph speaks more to historical understanding, correct, as opposed to current understanding?
MR. LEWIS: Objection, because if you read the rest of the paragraph, obviously, it talks about current understanding as I see it. So I think that misstates what the --
MR. STANSBURY: Provided we're limiting this to toxicity. On the issue of toxicity, I see the Meeker study --

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MR. LEWIS: Why don't you restate your question --
MR. STANSBURY: Yeah, maybe --
MR. LEWIS: -- and I won't object if that's what you're limiting it to.
MR. STANSBURY: Right, that's what I'm limiting it to.
Q. (By Mr. Stansbury) This, the discussion of toxicity in this paragraph speaks to when the medical community first became aware that tremolite was toxic but is not necessarily the authoritative source today for determining the toxicity of these fibers, correct?
MR. LEWIS: Of asbestos -- of Libby fibers?
MR. STANSBURY: Of Libby fibers.
MR. LEWIS: Okay. No objection.
THE WITNESS: Well, yeah, the reference to Vorwald talks about the toxicity as evaluated through tox studies in his lab in 1951. But that, by no means, was the only discussion of the hazards of --
Q. (By Mr. Stansbury) Right.
A. -- or the toxicity of tremolite prior to that.
Q. Okay. And then you also cite to Meeker in this paragraph, correct?
A. Yes.
Q. And for the purpose of -- I'll read this for

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the record: "More recently, sophisticated analysis has shown that Libby asbestos is 84% winchite, 11% richterite, and 6% tremolite."
Did I read that correctly, sir?
A. Yes.
Q. Okay. And as you stated, you're not a mineralogist, correct.
A. No.
Q. You're not a toxicologist, correct?
A. Correct.
Q. You don't have any opinions that go beyond what is available in the public literature with respect to the toxicology or mineralogy of the Libby fibers, correct?
A. Correct.
Q. Okay. Paragraph 37, once again, this paragraph, similar to the ones before it, discusses the historical understanding by the medical community of potential health risks caused by asbestos, correct?
A. Well, the health risks -- I'll read that again. (Perusing document) -- yes.
Q. Okay. And similarly, Paragraph 38 also refers to historical knowledge of the health effects from exposure to asbestos, correct?
A. Yes.
Q. And Paragraph 39 also refers to the historical

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understanding of health effects associated with exposure to asbestos, correct?
A. Yes.
Q. And Paragraph 40 also refers to the historical understanding of medical literature with the caveat here that you mentioned industrial hygienists often review this literature, correct?
A. Yes.
Q. Okay. If I could read Paragraph 40 for the record:
"By the 1960s, hundreds of articles and studies published in the industrial hygiene and medical literature established that asbestos exposure is harmful and can be fatal. These materials were readily available to anyone interested in learning about the dangers of asbestos. As a standard practice, industrial hygienists review industrial hygiene literature, as well as occupational medicine literature."
Did I read that correctly, sir?
A. Yes.
Q. Okay. So once again, we're speaking about the state as of the 1960s, correct?
A. Yes.
Q. Okay. Paragraph 41, this paragraph speaks about historical conditions but specifically discusses

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potential community exposures arising out of the historical conditions, correct, sir?
A. Yes. It's speaking to the, you know, the aerodynamic properties of asbestos and how it can expose people who are not directly working with the material.
Q. In Paragraph 42 --
A. It also speaks -- if I may interrupt for just a second --
Q. Sure.
A. -- it also speaks to control.
Q. Historical control?
A. Well, it's -- the same controls we use now are what was used historically, so -- (pause.)
Q. Okay. But obviously because we're talking about Libby, we're talking about historical operation because it hasn't been operation for, I guess, 18 - 19 years, correct?
A. That's fine.
Q. Okay. In Paragraph 42, I'm going to read the first sentence: "Asbestos fibers in the air are known to travel long distances from their source or point of origin."
Did I read that correctly, sir?
A. Yes.
Q. And then you cite to the Environmental

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Protection Agency, and you say as follows, which states as follows:
"'During the time that the asbestos fiber remains airborne, it is able to move laterally with air currents and contaminate spaces distant from the point of release. Significant levels of contamination have been documented hundreds of meters from a point source of asbestos fibers, and fibers also move across contamination barrier symptoms with the passage of workers during removal of material.
"'The theoretical times needed for such respirable fibers to settle from a 3 meter ceiling are 4, 20 and 80 hours in still air. Turbulence will prolong the settling and also cause reentrainment of fallen fibers,' (Sprayed Asbestos Containing Materials in Buildings, A Guidance Document, U.S. Envirnomental Protection Agency, March 1978)."
Did I read that correctly, sir?
A. Yes.
Q. So this is a cite to an EPA source a little over 30 years ago, correct?
A. In 1978, yes.
Q. Discussing how asbestos fibers travel, correct?
A. Yes.

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Q. Has our understanding of how asbestos fibers behaved in the air changed in any way in the last 31 years?
A. Very little if at all.
Q. Okay, okay. So again, this paragraph would speak to, you know, ultimately would speak to the potential for exposure in the community, correct?
A. Yes, bystander exposure, I think.
Q. Okay, okay. Paragraph 43, does that similarly speak to the potential exposure of a bystander?
A. Yes.
Q. Okay.
MR. LEWIS: Counsel, I'm not trying to be difficult here, but "bystander" has legal connotations as well, like a bystander liability, and I'm a little concerned about that. So I don't want to interrupt your examination. I think I understand what you mean by "bystander", but if you don't, on my examination, I'll ask the witness his understanding of bystander.
If you could clear that up now, I think that might be helpful.
MR. STANSBURY: Okay.
MR. LEWIS: It's up to you.
Q. (By Mr. Stansbury) I'm getting "bystander exposure" from your report. That's in Paragraph 43; is it

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not?
A. Correct.
Q. And what do you mean by "bystander exposure"?
A. "Bystander" would mean, again, someone who is not working directly with the material, but they're doing something else at distances away from that job.
Q. Right.
A. So that's what I mean by "bystander."
Q. Okay.
A. It's kind of a loose term, I guess.
Q. Sure.
MR. LEWIS: Thank you, Counsel, for allowing that clarification.
Q. (By Mr. Stansbury) Paragraph 44, I think this paragraph relates to general principles of industrial hygiene, correct?
A. Yes.
Q. It's not specific to Libby in any way, is it not?
A. It's general industrial hygiene principles.
Q. Okay. Paragraph 45, does this relate to the historical conditions and operations of the Libby vermiculite mine?
A. (Perusing document) -- in part, yes.
Q. What else does it relate to?

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A. Yeah, it relates to percentages, basically, in the materials, so it would be historical.
Q. Okay. And Paragraph 46, reading the first sentence, "Soil containing Libby asbestos at levels equal to or greater than 1% are generally considered a health hazard requiring remediation," did I read that correctly, sir?
A. Yes.
Q. What is your basis for that sentence?
A. My basis for that sentence is published studies from EPA, Atkinson's, I think, study. I think they might be listed in here.
Q. Is it --
A. NIOSH; there's a series of articles that discuss this 1 percent issue, if that's what we want to --
Q. Is it a federally mandated action level? Is that your understanding?
A. And we're talking about the 1 percent?
Q. Yes, yes.
A. The 1 percent is a, is a percentage which would be considered asbestos containing for removal, I guess would be the best way to describe it.
Q. Okay. As an industrial hygienist, is it common for you to examine the asbestos content of soil?

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A. Well, we have -- or I have. It could be one of our tasks, yes.
Q. Do you have any training studying the propensity of asbestos fibers to be released from soil?
A. Well, we've -- again, the literature tells us how it could be released from soils. In terms of my personal experience, yeah, we've collected soil samples for asbestos and -- (pause.)
Q. So you did examination of - and maybe I'm using this term incorrectly - "bulk material," correct?
A. Yes.
Q. Okay. That's distinct, though, from doing airborne measurements, correct?
A. Yes.
Q. Okay. Do you have an opinion as to the propensity of asbestos in soil to be released into the ambient air?
A. Yes.
Q. What is your opinion?
A. My opinion is that amphobile asbestos from Libby can be released into the air if it is contained in low, very low percentages within the soil; very clear.
Q. Okay. And what is your basis for that opinion?
A. Again, studies that have been done by EPA in

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Libby; Atkinson's; NIOSH considers it to be a friable material where if not bound up in anything, it's going to be released from the material that it's contained in. The fibers are all loose.
Q. You say: "A review of the literature." Prior to working with Libby, had you ever studied the propensity of asbestos to be released from soil?
A. No.
Q. Okay. Had you ever studied releases of any hazard from soil?
A. From soil, no.
Q. Okay. So soil analysis was not something that you had previously done until you got involved with Libby, correct?
A. That would be fair.
Q. In your 20 -- how many years have you been an industrial hygienist?
A. I don't know; 30.
Q. Thirty years, okay. So dealing with soil was not something that you had dealt with previously.
A. Well, you know, I hate to be limited. I mean I've been involved with looking at asbestos levels in dust, in other words. I don't know if you want to call that "soil," but soil -- I'm trying to think if I've done soil work previous to the Libby work, and I can't remember

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if I'm looking at dust levels or levels that are contained in the dust on a surface, or something like that.
Q. For example, settled dust that has settled on a surface of part of an industrial facility? Is that what you're talking about?
A. Yes.
Q. Okay.
A. Or a home or something like that.
Q. Right. But that is distinct from soil, is it not?
A. Yes.
Q. Okay. And the tendency of an asbestos fiber to be released from a flat surface is certainly different than a tendency of an asbestos fiber to be released from soil, correct?
A. Well, it could be. I think it's all related to activity.
Q. Okay. What activities have you personally done to determine the tendency of asbestos to be released from soil?
A. Well, what activities have I done -- I mean we're currently involved with a research project where we're analyzing surface dust in homes that contain vermiculite attic insulation. We are taking air samples at the same time. So we're trying to establish if there

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is a risk from surface contamination as to an airborne exposure. So that's the work I've done.
Q. But that's not soil. That is asbestos within a home. That's not asbestos that is in the soil on the ground, correct?
A. Right, it's in a house or --
Q. Okay. And that's what industrial hygienists tend to look at is soil within -- excuse me. Strike that.
Industrial hygienists tend to examine asbestos within a facility or on a settled surface, correct?
A. Well, no, I wouldn't say that. I mean you could have an industrial facility where they're doing a removal job like asbestos siding. And obviously, the soil is contaminated from that siding, so we would look at soil. And we've done that up at Montana Tech.
Q. Okay. But the question I had asked earlier, which elicited the response regarding the work you've done in homes, was what work you have done studying the release of asbestos from soil in Libby.
A. Well, again, it would be the same sort of situation where -- an industrial hygienist would be concerned about a release into any media, whether it be soil or dust, and we certainly take air samples in conjunction with that. So whether or not we can establish a relationship between what's in the soil or the media and

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the air is another question, but we certainly look at those aspects.
Q. I understand looking at the aspect, but sitting here today, have you derived a relationship from your work that compares the amount of asbestos in soil with the amount of asbestos that's released into the air when the soil is disrupted?
A. Well, no, that's work that's ongoing right now in Libby. No one had that relationship right now.
Q. So sitting in here, sitting here today, you're not aware of any reliable source that would allow us to determine the potential airborne releases from asbestos in soil?
MR. LEWIS: I'm going to object to the form of the question because I think that assumes -- misstates the witness evidence in the sense that he was talking about quantification as to whether or not there were such releases, but -- so I think the question assumes facts not in evidence.
MR. STANSBURY: I think you could say "assumes facts not in evidence" without coaching the witness. I would appreciate doing so next time.
You may answer.
MR. LEWIS: Well, I would appreciate, Counsel, that when you restate his testimony, you restate it

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accurately. And that's the problem here. If you're going to load up your questions by your own paraphrase of his testimony and -- that's deceptive questioning and that's what I object to here.
MR. STANSBURY: Okay. Let's get back to -- let's refocus on that for a moment.
Could you read the last pending question, please.
(The record was read by the court reporter as follows:
"QUESTION: So sitting here today, you're not aware of any reliable source that would allow us to determine the potential airborne releases from asbestos in soil?")
THE WITNESS: Well, I'm aware of studies that have been done and are being done by the EPA in Libby where they are evaluating release of asbestos fibers from soil.
BY MR. STANSBURY:
Q. Okay. Other than those studies, anything else?
A. Not that I can think of right now.
Q. Okay. So let's talk about those studies, then. Are these studies that are ongoing now?
A. Well, they're doing activity-based sampling in

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Libby right now, in Libby and up at the mine.
Q. Um-hmm.
A. Paul Peronard did the initial studies in the early '90s in Libby where they did activity-based sampling to try to determine what is coming off gardening, driveways, working with soils as well as other types of media, sure.
Q. Okay. Did you rely upon those results in formulating your opinions regarding the hazards from asbestos in soil in Libby?
A. Yes. This 1 percent issue, yes, I've relied on that.
Q. Specifically, you relied upon the studies done by EPA, correct?
A. Yeah, I relied on the knowledge I have accrued in reading EPA documents both before I became a technical advisor for the TAG and after.
Q. Okay. And which -- by "EPA documents," we're talking about post 1999 EPA documents, correct, the ones that deal with the studies that you're referencing?
Those all began when Paul Peronard came to Libby in November of '99, correct?
A. Yes.
Q. Okay. So with respect to those post 1999 EPA studies, which ones have been published?

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A. Well, they're published by EPA, I guess. I don't know how to answer your question. I'm trying to look -- yeah, like they're referencing the Christopher Weis memorandum is referenced in Paragraph 48, so those are the types of things I'm referring to.

Q. The Christopher Weis memorandum, so we're clear, the one in Paragraph 48 that relates to -- now I'm going to read the statement that you have citing that and let me know if I read it correctly:

"These results clearly indicate that vermiculite insulation in homes or commercial buildings is a substantial reservoir of asbestos-contaminated source material that may lead to ongoing exposure of area residents and workers."

Did I read that correctly, sir?

A. Yes.

Q. Okay. So he's talking about, again, asbestos in homes and in commercial buildings, correct?

A. Yes, as part of the work that was done up there by Peronard and others, looking at exposure levels that are coming from soil and different sort of things based on activities that are being done.

Q. Okay. But that citation here that you list, this is not speaking about soils specifically, is it not?

A. If you read the citation, I think you will

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find that it's talking about soil, but -- if you read the paper.

Q. Okay. So is it fair to say, then, that one item we have identified that informs your opinion about the potential release of asbestos from soil is the Chris Weis action memorandum?

A. Yes.

Q. Okay. Anything else?

A. Well, there's been more recent publications by EPA in the later time period where they are -- where they've collected indoor air samples at a given period in time, and then they've gone back and collected indoor air samples later on. And they are attributing in their documents to this increase in indoor air asbestos at a later date due to the soil, the soil contamination. So that informs my opinion.

Q. How would indoor air be related to releases from soil?

A. Because it blows into the house. I'm not talking, you know, anything too complicated here.

Q. Okay. So -- and when was this study conducted?

A. Well, I think there's been some done in the early, well, probably 2005 - 2006. There are technical memorandums. I can't quote them by --

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Q. Right.

A. -- number, but -- (pause.)

Q. Were these memoranda cited in your report?

A. I don't know if they're cited in my report or not. They may not be.

Q. Okay. Sitting here today, were these memoranda included among your reliance materials?

A. Yes. Well, I mean, it's like I say, I'm trying to include --

Q. Well, did you produce copies? Are you aware of whether copies of these memoranda were produced to us?

A. I'm not aware of that.

Q. Okay.

A. You were asking me about my knowledge of soil and release of asbestos from the soil.

Q. Understood. So clearly, you clearly relied on these memoranda in reaching this opinion, correct?

A. I've relied on all of the documents that I've read over the years pertaining to potential of release from soils into the air.

Q. Okay. And so far we've listed the Chris Weis memoranda; the EPA studies that look at indoor air that, I believe you said, inferred that the indoor air was a result of asbestos being blown in from the soil. Is that correct?

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A. I believe that's what they concluded.

Q. Okay. Are there any other sources that inform your opinion as to the propensity of asbestos be released from soil?

A. Well, again, there's other citations: EPA 2001, EPA 2004.

Q. I'm sorry, which page are we on?

A. I was looking under Paragraph 46.

Q. The ones that speak to the --

A. It begins with soil containing Libby asbestos.

Q. Sitting here today, are you aware of a correlation between asbestos and soil and the amount of asbestos that can be released into the air?

A. Well, that's a question mark.

Q. Okay. So that's certainly something you cannot say reliably that "X" level of asbestos in the soil will produce "Y" level of asbestos in the air, correct?

A. That would be correct.

Q. Okay.

MR. LEWIS: Is it a good time for a break?

MR. STANSBURY: Yeah, let's take a break. That's fine.

VIDEOGRAPHER: The time is 11:08. We're off of the record.

(The lunch recess was taken.)

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VIDEOGRAPHER: This is Tape 3 of the videotaped deposition of Dr. Terry Spear.
The time is 11:47. We're on the record.
BY MR. STANSBURY:
Q. Okay. Dr. Spear, can we move to Paragraph 52, please. And in 52 and 53, there are statements here regarding the toxicity of asbestos from Libby; is that correct, sir?
A. Yes.
Q. And once again, you are not a toxicologist, correct?
A. That's correct.
Q. You don't intend to offer any specific opinions about toxicity at the confirmation hearing, do you?
A. I cannot offer any opinions on toxicology, no.
Q. Okay. Dr. Spear, have you reviewed the Amandus paper, 1987?
A. I have at one point in time, yes.
Q. Okay. Who is Harlan Amandus?
A. I'm sorry, who is he?
Q. Yeah. Do you know who he is?
A. No.
Q. Okay. You've never met him before?
A. I've never met him.

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Q. You are aware that he was working at NIOSH at the time he wrote that paper, correct?
A. Yes.
Q. NIOSH is the National Institute of Occupational Safety and Health; is that correct?
A. Yes.
Q. And that is part of the United States Government, is it not?
A. Yes.
(Document marked Deposition Exhibit No. 7 for identification.)
BY MR. STANSBURY:
Q. Okay. I'm handing you what's been marked as Exhibit 7. Exhibit 7 is "The Morbidity and Mortality of Vermiculite Miners and Millers Exposed to Tremolite: Part I. Exposure Estimates"; authors: Amandus, Wheeler, Jankovic, and Tucker; published in 1987 in the American Journal of Industrial Medicine.
Did I read that correctly, sir?
A. Yes.
Q. Okay. And do you -- is this familiar with you? Do you recognize this document?
A. Yes.
Q. Okay. This is the paper by Amandus that specifically focuses on establishing the exposures,

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correct?
A. That's correct.
Q. Because in order to determine something like toxicity, you need to know information about exposure, correct?
A. Yes.
Q. Okay. And this is clearly the paper of the three most relevant to your area of expertise, is it not?
A. I'm sorry, by "three" --
Q. You're aware that there was a mortality study and a morbidity study also done by Amandus, correct?
A. Yes.
Q. Okay. And so the papers that look at, those papers, the morbidity study, are you familiar with that?
A. Yes.
Q. Okay. That looked at radiographic abnormalities in the working population and correlated that to exposures, correct?
A. Yes.
Q. The mortality study looked at mortality within a worker cohort and correlated that with exposure, correct?
A. Yes.
Q. Both papers were dependent upon the exposure data contained in this paper, correct?

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A. That's correct.
Q. And of the three papers, this is the paper that primary falls within your area of expertise, correct?
A. Well, in terms of exposure measurement, yes.
Q. Yes, okay. And do you have any general opinions regarding this paper?
A. Well, I've read this paper, you know, associated with other W.R. Grace cases, and my general opinion pertaining to any exposure measurements at the mine site, or it may be if it was done outside the mine site in Libby, is that during this time frame, they were basically looking at PCM analysis. And in my opinion, the fibers that were less than 5 micrometers in length are not being factored into the exposure.
Q. Five micrometers or five microns?
A. The same thing: Microns/micrometers.
Q. Micrometers is the same -- okay, got it.
So you believe that this paper should have looked at fibers with -- that were less than 5 microns in length, correct?
A. Yeah. As an industrial hygienist, my opinion is that the -- that fibers shorter than 5 micrometers can be toxic, but we don't know that they're not toxic. And I'm uncomfortable with not considering that in either risk assessment, or evaluation, or what have you.

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Q. Are you aware of other epidemiological studies that only counted fibers longer than 5 microns in length?
A. That's been the standard practice.
Q. Okay. So this paper is in no way an outlier, so to speak, insofar as they only counted fibers longer than 5 micrometers, correct?
A. Correct.
Q. It's just something that you personally, Dr. Spear, do not agree with, correct?
A. Well, not just me personally, but there's an accumulating -- I mean I think that, hopefully, the risk of asbestos will eventually look at short fibers, not just long fibers. The reason that they were looking at long fibers was simply due to the analytical sensitivity of the method. OSHA's current standard of 0.1 fibers per cc is that level because that is the level of analytical sensitivity; in other words, we have no reliability if we're trying to quantify fibers at lower levels. And so hopefully as technology increases and we can start more consistently evaluating all fibers, then the risk will take into account short fibers. That's my opinion.
Q. Okay. So, you know, we've already established, correct, that it is common in industrial hygiene literature to report only those asbestos fibers that are longer than 5 microns in length, correct?

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A. Yes.
Q. Okay. However, if you were to report all fibers, including those that are less than 5 microns, that would, typically, have the effect to increase the amount of fibers that are counted, correct?
A. Yes.
Q. Okay. So the exposures would appear higher, correct?
A. Well, it would be representative of what a person breathes in, whether they're short fibers or long fibers, yes.
Q. Okay. But just to make sure we're clear, so let's say somebody had 5 fibers per cc only counting fibers that were 5 microns or longer, if you were to count all fibers, you would expect that person to have a higher exposure measurement, correct?
A. Yes.
Q. Okay. And although we discussed earlier you're not a toxicologist or an epidemiologist, but as an industrial hygienist, you do understand how exposure quantifications fit into a toxicology analysis, correct?
A. Yes.
Q. Okay. And one of the data points, for example, on a mortality study would be actual mortality, the people who have died, correct?

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A. Yes.
Q. When they died, correct?
A. Yes.
Q. And information related to that. And that mortality, it becomes -- is compared to their exposure in order to drive the toxicity of the substance, correct?
A. Yes.
Q. Okay. And so if you were to do an analysis looking at fibers at level "X", given a certain level of the mortality, and then you were to derive a toxicity factor - we can assume that you've just done that for a moment because I don't want to ask too long of a question - but that makes sense, correct?
A. Kind of, I guess.
Q. Well, determining -- let me make sure we're on the same page. You determine toxicity based on certain exposure levels, correct?
A. Yes, and length of exposure.
Q. And length of exposure. So you get cumulative exposure, correct?
A. Yes.
Q. So if the exposure levels are higher at the same length of exposure, you're going to have higher cumulative exposure, correct?
A. Yes.

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Q. And thank you for pointing this out. It's that accumulative exposure that is then used and compared against mortality to derive the toxicity of the substance, correct?
A. Yes.
Q. And that's not specific to asbestos. This is the way you would approach any type of exposure to a hazard if you wanted to derive the toxicity, correct?
A. That's correct.
Q. Okay. So if you were to -- when evaluating that initial exposure, if you were to include additional fibers, let's say shorter fibers, that would give you a higher exposure measurement, correct?
A. Yes.
Q. And over the same duration, a higher cumulative exposure, correct?
A. Yes.
Q. So if you were looking at the exact same analysis, although now you have higher cumulative exposures, that would show a lower level of toxicity for the substance, would it not?
A. It could, but I don't think the same points apply to morbidity, either, or disease rates, you know, in a person, what rates actually cause disease prior to mortality.

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Q. I'm sorry, I don't follow.
A. Well, I just -- I don't agree with that same philosophy in terms of you're talking about mortality studies or people dying from asbestos. I think that to determine risk of asbestos exposure in causing disease, I do think that we have to consider total exposure.
Q. Okay. And I'm not contesting that at this moment. But looking at total exposure, if you do get higher exposure because you're counting additional fibers and you use that number to determine cumulative exposure, the toxicity of the substance will be lower, assuming that the mortality end points are the same, correct?
A. Because of using -- I understand your point.
Q. Okay. And just so I make sure I understand my own point, to the extent that Dr. Amandus, working for NIOSH, may have excluded fibers shorter than 5 microns, that would have the impact of increasing the toxicity of the Libby amphiboles based on the findings of the study, correct?
MR. LEWIS: Hold on. I object to that question. That question is very ambiguous. What's the antecedent for the pronoun "that" in your question?
Q. (By Mr. Stansbury) Dr. Spear, you seem to understand the question.
MR. LEWIS: Well, the question -- that doesn't

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make any difference whether -- if the question is improper, it's improper. It's misleading, it's vague, it's also compound.
MR. STANSBURY: I'll ask you to, again, not coach the witness.
MR. LEWIS: I didn't coach the witness. What did I say to the witness there, Counsel?
MR. STANSBURY: Could you please read back the last question, madam court reporter?
(The record was read by the court reporter as follows:
"QUESTION: And just so I make sure I understand my own point, to the extent that Dr. Amandus, working for NIOSH, may have excluded fibers shorter than" --
MR. STANSBURY: Let me try to ask the question in a way that will, you know, address everybody's concerns.
BY MR. STANSBURY:
Q. To the extent that Dr. Amandus, working for NIOSH, may have under-counted fibers by excluding fibers shorter than 5 microns, by doing so, given the mortality and morbidity end points he worked with, that would have the effect of reporting a toxicity factor in the Libby amphibole that actually may have been higher were he to

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have followed your suggested method of counting all fibers, correct?
A. It could have that effect.
Q. Okay. Other than the exclusion of fibers shorter than 5 microns, are there any other statements in Dr. Amandus's paper or any other findings that you find to be unsupportable scientifically?
A. Well, no. It was a peer-reviewed article and, certainly, it's been referenced and cited many times. There's always questions on exposure reconstruction.
Q. Okay.
A. Things like that.
Q. Okay. I wanted to walk through a couple parts of this paper, then. And starting on page 2, under "Exposure Measurements":
"Samples of airborne dust have been taken in the mill since 1942 and in the mine since 1968. Prior to 1969, 336 midget impinger samples were collected by the state of Montana primarily in the dry mill, and after 1967, 4116 membrane filter samples of airborne dust were collected by federal agencies (NIOSH, MESA, and MSHA)" - NIOSH, MESA, and MSHA, just so the court reporter is clear - "and the company in most areas of the facility (Table II). Before 1974, filter samples were either general area or short-term personal samplings collected over periods

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ranging from 20 minutes to several hours, and were not likely to have reflected the 8-hr TWA exposure."
Did I read that correctly, sir?
A. Yes.
Q. Do you agree with this approach?
A. Well, yes, because -- well, I agree. That approach does still take place today.
Q. Okay. And MESA, M-E-S-A, that no longer exists by that name, correct?
A. Right.
Q. What did MESA stand for?
A. The Mine Enforcement and Safety Administration, I think.
Q. And that was a federal agency --
A. Yeah.
Q. -- correct --
A. Yes.
Q. -- or administration. And then MSHA, that's the successor to MESA?
A. Yes.
Q. And what does MSHA stand for?
A. Mine Safety and Health Administration.
Q. Okay. And if you could turn to Table III -- or page 3, Table II, excuse me. "Table II. Description of Environmental Samples," this reflects where this data

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in this paper was collected from, correct?
A. Yes.
Q. And 789 of the samples from 1971 to 1981 were collected by MESA and/or MSHA, correct, sir?
A. Yes, sir.
Q. Forty-eight of the samples from 1967 to '68 were collected by NIOSH, correct?
A. Yes.
Q. And then 336 samples using the mppcf measurement were collected from 1956 to 1969 by the State of Montana, correct?
A. Yes.
Q. And so -- and then the company between 1970 and 1982 collected 3,279 samples, correct?
A. That's what the Table II says, yes.
Q. Okay. And again, this is a peer-reviewed study. You have no reason to dispute that, correct?
A. I'm sorry?
Q. Again, this is a peer-reviewed study. You have no reason to dispute the findings of the table, correct?
A. No.
Q. Okay. So it's fair to say that the exposure data underlying this study was based on a large number of samples, correct?

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A. There are a large number of samples, yes.
Q. Okay. Some of which were collected by the State of Montana, correct?
A. Yes.
Q. And some by various federal agencies, correct?
A. Yes.
Q. Okay. Are you familiar with how he derived the location operations approach to estimating exposures?
A. I've looked at it before.
Q. Okay.
A. I'm vaguely familiar with it.
Q. Okay. Do you have any reason to believe that using location operations -- well, strike that.
Is the use of location operations to estimate exposures within a facility a common practice in industrial hygiene?
A. Well, we would typically nowadays try to divide work forces up into similar exposed groups. And they don't necessarily have to be in one location, they could be similar groups that work in different locations, but I believe this is a method that they used then.
Q. Okay. And you consider it a reliable method?
A. Well, I think "reliable" to as reliable as it can be.
Q. Okay. Does the use of location operation

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cause you to have less confidence in this paper?
A. It could, well, particularly when workers -- you know, if they're in and out of different locations and move a lot.
Q. Okay. Do you believe they try to take into account the idea of individuals moving in and out of locations?
A. I'm sure they did.
Q. Okay. On Table IV -- excuse me, page 4 Table III, now, this table summarizes the average fiber per cc values calculated from membrane filter samples collected in 1967 through 1962 by location, operation, and year, correct?
A. Um-hmm.
Q. "Yes," sir?
A. Yes.
Q. Okay. And I want to look at a couple of these measurements. Specifically, the new wet mill, post '76, the average exposure was 0.8 fibers per cc, correct?
A. I need to make sure I know where you're looking at again.
Q. Sure.
A. You're on Table III?
Q. Yes.
A. You're looking at new wet mill?

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Q. Yes, post '76, after '76.
A. Oh, okay.
Q. That's 0.8 fibers per cc, correct, sir?
A. Yes.
Q. And that's based on 1,214 samples, correct?
A. Yes.
Q. Do you recall what the MSHA PEL was in 1976?
A. I don't recall. It could have been 5. I know MSHA was always slower than OSHA in changing PEL --
Q. Right.
A. -- their limits.
Q. Right. But it was certainly higher than 0.8, correct?
A. Yes, and it's -- but this number is certainly higher than the current, the current exposure limit, which --
Q. The current OSHA PEL or MSHA PEL?
A. The OSHA PEL.
Q. Right. Is it your understanding that MSHA or OSHA was primarily responsible for regulating the mine?
A. Well, I think for the mine itself, it was MSHA. And then for some of the in-town facilities, I believe OSHA would have had some jurisdiction. I've had this discussion --
Q. Right.

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A. -- before in depositions.
Q. Okay. Is it fair to say that for the mill associated with the mine, that would still fall under MSHA's jurisdiction?
A. Yes.
Q. Okay. And 1976 on, the PEL within that wet mill was below MSHA's PEL, correct?
A. Yes.
Q. Okay. Moving on, sir, on page 5, there seems to be an issue with converting mppcf to fibers per cc, correct?
A. Yes.
Q. And this is certainly an analysis that I believe requires some estimation, correct?
A. Well, yes. It's very suspect, particularly unless all of the other sampling variables were the same. You know, I mean it's hard to apply that conversion across the board.
Q. Right. So that conversion, though, would only have been used for samples that were created prior to 1969, correct?
A. Yes.
Q. Because after 1969, they're using fiber per cc, correct?
A. Yes.

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Q. Okay. So to the extent there are any questions over this conversion, that would relate to pre-1969 exposures. Am I correct, sir?
A. Yes, wherever they were using million particles per cubic foot.
Q. Okay. And those exposures were very high, correct?
A. Yes.
Q. Nobody disputes that the exposures in the dry mill were well in access of any PEL, correct?
A. Say that again.
Q. The exposures in the dry mill were, in some cases, over 100 fibers per cc, correct?
A. Yes.
Q. Okay. And so while there may be some ambiguity in converting the mppcf to fibers per cc, we're still dealing with very large numbers, correct?
A. Yes.
Q. This is not an instance where we're trying to convert data and seeing whether it fits under a 0.1 or 0.5 PEL. We're talking about data that involved measurements that are very high, even if there is some imprecision in the conversion, correct?
A. Yes.
Q. Okay. And if we look on page 6, we see Table

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V, which is the conversion ratio. This appears to be a matrix that compares measurements of mppcf to fibers per cc; is that correct, sir?
A. Yes.
Q. Have you ever seen the use of a matrix of this form before?
A. Very seldom, I guess. Only in these earlier studies pertaining to the -- well, I'm sure it was done with other asbestos work, too.
Q. Right. But it wouldn't be done nowadays because we're not using mppcf any more, are we?
A. Right.
Q. So during this period of transition was when these types of problems arose, correct?
A. Yes. And the reason we aren't using million particles per cubic foot any more is because it was highly unreliable and it was very difficult to try to count asbestos fibers using that method, so it's certainly all very unreliable.
Q. Okay. Have you ever relied upon a study that used mppcf in its measurements?
A. No. I don't know what you mean.
Q. Well, you say it's unreliable, measurements that are measured in mppcf. You were citing studies earlier in your expert report that were pre 1965 in some

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instances.
A. Right.
Q. Those studies would have used mppcf, correct?
A. Yes.
Q. So it's not as if Amandus was using data that nobody else had ever used in the published literature, correct?
A. Well, right. That was the only choice we had.
Q. Right. And given that, is the use of a matrix a reasonable means of trying to convert mppcf to fiber per cc?
MR. LEWIS: You mean today? Give some time foundation. You said "is" rather than "was."
Q. (By Mr. Stansbury) Well, we're never going to deal with any data post 1967 -- '69 or '70 that's in mppcf's. We're always talking about historical data, are we not?
A. Yes.
Q. Okay. So given -- dealing with this data in which you do have a comprehensive exposure analysis that goes in an era from mppcf to a time in which we're measuring in fiber per cc, is the use of a matrix a reasonable method for converting mppcf to fibers per cc?
A. Yes. I think Amandus was trying to use historical data, as unreliable as it may be. In terms of

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identifying fibers, he was trying to use it. He had historical data that he was trying to use.
Q. Okay. And is that a reasonable method to do so?
A. I'm sure it's been done before.
Q. Okay. So he's not an outlier in this regard?
A. No.
Q. Okay. And if you look on the bottom -- on the middle of page 6, I guess it's the last sentence of the first full paragraph, we see the line: "Due to the lack of exposure data in these areas, estimates before 1968 are considered 'guesstimates.'"
Did I read that correctly, sir?
A. I want to make sure I know where you're reading that at.
Q. Sure; sure, sure.
A. Where, where were you at again?
Q. Oh, sure. I'm right here -- (indicating.)
A. So "due to the lack of exposure," that's where you started?
Q. Yes, sir.
A. I do see that, yes.
Q. Okay. So he's certainly being very forthcoming over some of the limitations of the data, correct?

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A. Yes.
Q. Later, in the next sentence -- the next paragraph, actually, he says:
"However, the 'guesstimates' for those LOs prior to 1968 had a small effect on the average cumulative exposure estimate for the overall cohort, and on the estimates of the exposure-response curves, because a small number of workers was employed in these areas."
Did I read that correctly, sir?
A. You read that correctly.
Q. Do you believe that's a relevant qualification for the guesstimate issue that he himself has flagged?
A. Well, it is in the aspect that when he's looking at number of workers employed under a given job class in these areas, but it does not really factor in employees that have to go through those area, or even in it's intermittently, that do not have that job class. So that would be the only caveat I would add.
Q. So that might have the impact of underestimating exposure?
A. Well, or just not determining exposure to all workers because they weren't in that job class. There were other workers who went through that area who were exposed.
Q. Okay. The next paragraph, there does seem to

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be, if I'm not mistaken, some effort to address the fact that workers moved throughout the course of the day, correct?
MR. LEWIS: I'm going to object. The question is argumentative. The question is a paraphrase. It's not a proper question. Object to the form of the question.
Q. (By Mr. Stansbury) Okay, you may answer, sir.
A. So we're referring to the last paragraph, then?
Q. Yes.
A. Yes. He's saying that weighted by the proportion of time a worker employed in a job spent in an LO area. Okay, but again, if there's workers just going through that area, they're not considered in that job class. So that's, that's just, you know, my interpretation.
Q. Okay. But the impact, the net impact of not classifying workers who move in and out of areas could both increase or decrease exposure estimates, correct?
A. It could.
Q. Okay. So it's not necessarily a bias that would have a specific impact of increasing or decreasing in one way for certain, correct?
A. Yeah, it's a bias I don't know how you would measure unless you had a pump on each person as they

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walked through these areas --
Q. Right.
A. -- but that wasn't done.
Q. But given the data that they had, this was again a reasonable means of trying to compensate for that?
A. Sure.
Q. Okay. Could we move to page 10, please, the "Discussion"? I'm going to read beginning with the first sentence under there:
"The questionable accuracy of the exposure estimates before 1968 is recognized. Key factors that need to be considered in estimating exposure are precision, time periods for combining samples, estimators, the conversion ratio, and assumptions as to exposures in areas where samples have not been taken. In most studies such as ours, there is little one can do but work within the constraints of the available data."
Did I read that correctly, sir?
A. Yes.
Q. Do you agree with that statement?
A. Yes.
Q. Okay. And again, just so we're clear, the guesstimate, that question applies to exposures that occurred prior, 1968 and earlier, correct?
A. Well, in talking about specific exposure

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results or quantification, yeah.
Q. Yes.
A. I mean, obviously, exposure areas where samples have not been taken, well, obviously, we don't have any exposure data, do we?
Q. Right. But there was, there was an attempt to address that, was there not?
A. Right.
Q. And that would be Table VI of the report, correct, sir?
A. Yes.
Q. So once again, they are making a reasonable effort to compensate for any limitations of the historical data, correct?
A. I think they were doing the best they could do with the data they had.
Q. Okay. Are there any -- strike that. Do you know of any other literature other than -- let me back up one second.
Dr. McDonald also did a study of this population, correct?
A. Yes.
Q. And is it fair to say that his exposure analysis has some of the same virtues and limitations that we just discussed with respect to Dr. Amandus's study?

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A. Yes.
Q. Okay. Other than Dr. Amandus and Dr. McDonald's papers, are you aware of any other published literature which more accurately captures the exposure experience within the Libby facility?
A. Involving the mine, no.
Q. Let me ask that again because you're right, I should have clarified. Other than Amandus and McDonald's papers, are you aware of any other published report that more accurately characterizes the asbestos exposure experience in the Libby vermiculite mining and milling operation?
A. No.
Q. Are you aware of any unpublished papers or reports that more accurately characterize the asbestos exposure conditions in the Libby vermiculite mining and milling operation?
A. I'm not.
Q. Okay. And you're familiar with the Sullivan paper. You mentioned it earlier, correct?
A. Yes.
Q. That was published in 2008? 2007?
A. Pretty recently, yes.
Q. Fairly recently. The exposure data for that paper was Amandus's paper that we just reviewed, correct?

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A. Yes.
Q. Okay. And that was also -- the Sullivan paper was a peer-reviewed, published paper, correct?
A. Yes.
Q. Okay. Now, when going through your report, we identified a lot of sections as dealing with Grace's conduct, correct?
A. Yes.
Q. And in reaching these opinions, you developed a certain amount of familiarity with the Libby vermiculite mining and milling operation as a whole, correct, sir?
A. In reaching these opinions?
Q. In reaching your opinions characterizing -- well, let me ask it a little bit differently.
In order to assess Grace's conduct, you first had to become very familiar with the Libby vermiculite mining and milling operation as a whole, correct?
A. Yes. I have been, I have been assessing this situation since 1996, and my opinions have not changed regardless of research that I've done in terms of how I think Grace behaved or the hazards of Libby amphibole.
Q. Right. And I guess the point I'm trying to reach, though, in reaching your opinions, you had to learn about what actually happened year in and year out at the mining operation in Libby, correct?

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A. Yes.
Q. Okay. So it is certainly an area where you consider yourself to be very familiar?
A. Yes.
Q. Okay. And part of the Libby operation involved sending ore elsewhere, correct?
A. Yes.
Q. Okay. And this was unexpanded vermiculite, correct?
A. Yes.
Q. And was there asbestos in that vermiculite?
A. Yes.
Q. And that asbestos would go where -- or, excuse me, that vermiculite would go where?
A. Well, the vermiculite would go to expanding plants across the country.
Q. Okay. Some of those plants were owned by Grace, correct?
A. I believe some of them were.
Q. And some of them were not, correct?
A. Yes.
Q. For example, O.M. Scott, the fertilizer manufacturing facility, expanded vermiculite, did they not?
A. Yes.

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Q. Okay. So that would be an example of an expanding operation that was not owned by Grace, correct?
A. Yes.
Q. Okay. And the workers in those plants would have been at risk of being exposed to asbestos, correct?
A. Yes.
Q. And in the case of the Marysville, Ohio facility, they were in fact exposed to asbestos, correct?
A. Yes.
Q. Okay. And you have no reason to believe that that would be any different in the numerous other expanding plants all across the country, correct?
A. That workers were exposed to asbestos?
Q. Yes.
A. No.
Q. Right. It occurred all over the country, did it not?
A. Yes.
Q. Okay. Now, are you familiar with the various products that were generated using Libby vermiculite?
A. I am somewhat familiar with the products. I've looked through the, you know, the exhibits over time and saw they used it in cement and --
Q. So let's, if we can -- which products are you familiar with?

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A. I don't know, Monokote; I don't know, other types of cement products I've seen in the exhibits; the insulation; foundation insulation.
Q. Okay. So like, for example, Monokote-3 --
A. Yes.
Q. -- that contained vermiculite and chrysotile, correct?
A. I believe so.
Q. So a person who was exposed to Monokote-3 may have been exposed to asbestos from Libby.
A. Yes.
Q. Okay. Similarly, a person who had Zonolite attic insulation in their home, they could have been exposed to asbestos from Libby, correct?
A. Yes.
Q. Okay. And to the extent that there were expanding operations in various cities, to the extent that there was -- well, let me rephrase this.
Have you studied exposures to asbestos from Libby that occurred outside of Libby?
A. We have done some preliminary work in Spokane.
Q. What kind of work is this?
A. It was, again, through the COBRE grant. And we basically did a very preliminary survey of neighborhoods surrounding the Spokane expanding plant.

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Q. And what were the findings of that analysis?
A. Well, they're very preliminary. In fact, they're still being worked up but -- so it's, I mean we -- fibers were detected in areas outside of the plant that is no longer there.
Q. Okay. So this is just one example; however, in this example, it illustrates that people outside of an expanding plant outside of Libby - in this case, Spokane - may have been exposed to asbestos that was released during the expanding process, correct?
A. I suppose that's correct. And then the other work would be - you said outside of Libby - would be associated with the vermiculite grant that we're currently working doing the homes.
Q. And this is -- oh, this is what we were speaking about earlier, looking at the attic insulation.
A. Right.
Q. Right. And so that -- and, okay. Is it fair to say there may be some distinctions there, though? With the attic insulation, you have exposure to already-expanded vermiculite, correct?
A. Yes.
Q. But there's still asbestos in it, right?
A. Yes.
Q. So there could be an exposure, correct?

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A. We're talking about the attic insulation?
Q. Yes.
A. Yes.
Q. An expanding plant, by its very nature, you have unexpanded vermiculite going in, correct?
A. Yes.
Q. So the people there may have been exposed to unexpanded vermiculite, correct?
A. As well as after it's expanded.
Q. Right. So, but it -- certainly, the exposure one would have to unexpanded vermiculite would be different, potentially, in terms of potential intensity than an exposure to expanded vermiculite, correct?
A. I mean it could be. I don't know if I've seen enough data to draw any conclusions on that.
Q. Now, within the Libby community, is it fair to say you have people - not workers, putting workers aside - within the Libby community, is it fair to say that you have people who were exposed in Libby to both unexpanded and expanded vermiculite?
A. Yes.
Q. What would be potential expanded vermiculite -- let me rephrase that.
What would be an example of expanded vermiculite exposures that would occur in Libby?

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A. Of expanded or unexpanded?
Q. Expanded.
A. Of expanded, the vermiculite attic insulation.
Q. Okay.
A. I believe some expanded stuff was used in some of the gardens or the lawns, and then people were expanding it themselves on their stoves to watch it pop.
Q. That's right. But that would actually be an exposure to unexpanded that became expanded, correct?
A. Expanded, yeah, I don't know.
Q. But what exposures to unexpanded vermiculite occurred within the Libby community?
A. Well, I think to the processed ore being hauled into Libby, for one; as well as material that was transported across the river and then brought into the town by railroad car, and then leaks occurred and contaminated areas around the railroad.
Q. So these leaks caused expansion -- so these leaks around the railroad caused exposure to unexpanded vermiculite in Libby, correct?
A. You asked about unexpanded, right?
Q. Yes, sir; yes.
A. I believe that the EPA has found unexpanded vermiculite in some of the operable units they're now currently trying to clean up.

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Q. And particularly with respect to the railroad exposures, those would also occur or could have occurred outside of Libby as well, correct?
A. I would say so, yes.
Q. Okay. Let me rephrase that a little bit more artfully. People outside of Libby may have been exposed to unexpanded vermiculite through leaks from railcars, correct?
A. Yes.
Q. And that would have meant -- that could have meant exposure to actual asbestos from those railcars, correct?
A. Yes.
Q. Libby asbestos, correct?
A. Yes.
Q. Okay. I'd like to go back to your 2006 paper. I believe it's Exhibit 3. I'm looking on page 2, and there's a picture of a map on page 2. That's Libby, correct -- or that's actually an area outside of Libby, correct?
A. Yeah, that's showing the mine road there.
MR. STANSBURY: All right. And just so the record is clear, by page 2, I mean page 461 of the published paper, but I think Dr. Spear understood what I meant.

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Q. (By Mr. Stansbury) And this is northeast of Libby, correct, sir?
A. Yes.
Q. Okay. And Location 1 appears to be just north of the mine, correct?
A. Well, Location 1 was actually right up at the mine site itself, I think.
Q. Okay. So you put that on mine property?
A. Yes.
Q. Okay. Location 2 appears to be north of the mine. Is that, is that a fair statement, sir?
A. Yes, going down the road a ways.
Q. How far from the mine would you say Location 2 is?
A. Probably a couple miles. I guess as the road travels, a couple miles; less by -- less as the crow flies.
Q. And then Location 3 occurred at what appears to be the intersection of Highway 37 and Rainey Creek Road; is that correct, sir?
A. Yes.
Q. Okay. Now, Location 1 and 2, can I just walk up there right now and sample that if I wanted to myself?
A. If you got permission from EPA, you could.
Q. I need permission from EPA, right, because

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that's a restricted area, correct?
A. Right.
Q. People just can't walk into either Location 1 or 2 that you sampled, right?
A. That is correct.
Q. What about Location 3?
A. Location 3 was just right off the highway, so that's open to access.
Q. Okay. So it's fair to say that the average person is not wandering around Location 1 or 2 on any given day, correct?
A. I hope not.
Q. Unless they're wearing a protective suit. Okay. Now, you say on page 461, page 2 of the document, looking at the left-hand column, second paragraph, last sentence, tell me if I read this correctly:
"Since asbestos fibers are durable silicates and do not decompose in the environment, the airborne asbestos fibers released and dispersed from the Libby mine and processing areas throughout7 0 years of operation have likely deposited throughout the surrounding areas."
Did I read that correctly, sir?
A. Yes.
Q. And this study looked at the depositing of fibers in bark, correct?

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A. Yes.
Q. Do you have any way of knowing whether the asbestos in a given bark, bark sample, was released 20 years ago as opposed to 40 years ago?
A. Not in samples collected in this area, we don't. We've collected samples outside of the mine sites in what's called the - I'm trying to think of the name - the Forest Service has a testing facility where they have larch trees or some type of tree. And all of those trees were planted after the mine was shut down, and we've done bark sampling in there and we've found fibers.
Q. Okay. But that would be part of that study you mentioned earlier, correct, the forestry? That's part of your forestry study?
A. Well, actually, it's been -- it's part of, kind of, a method to determine along -- you know, EPA has now done a lot of bark sampling in lines going out from the mine using our method, and basically -- so we basically started the work in trying to find out how far from the mine have they gone, so it's part of that work. We did do additional bark sampling as part of the Forest Service study. You are correct there.
Q. Okay. And that, that analysis, though, has not been discussed in your expert report. We didn't see it when we were looking at your report, correct?

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A. That's correct.
Q. Okay. But for this paper, you were not able to tell when the asbestos was actually released, correct?
A. That would be correct.
Q. Okay. Moving to page 462, page 3 of the document, looking at the table, and I see results here for tests that were done on various locations. I see three samples for Location 1; is that correct?
A. Yeah, so Location 1, three samples.
Q. And are those all bark samples?
A. Yes, they would all be bark samples.
Q. One question I had, if we could move, the same page but on the right column, I guess five lines down from the top: "Tree core samples were only collected from the locations surrounding the mine in the initial sampling program."
Did I read that correctly, sir?
A. Yes.
Q. What are the tree core samples?
A. When we began doing the bark sampling, we wanted to make sure we covered all bases, so we did take soil samples near the tree, we also took bark samples, and then we did tree core samples to make sure that the fibers were not being taken up by the root system and would be inside the tree, basically.

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Q. Right. And --
A. So then after we realized those were all negative and it doesn't seem very plausible they'd be taken up in the root system, we discontinued that approach.
Q. What about the soil samples? Did you publish the soil sample results?
A. They were not published as part of this paper and I don't even know what the results are.
Q. So you don't know whether there was asbestos in the actual soil there?
A. Yeah, I can't recall what happened to the soil samples.
Q. Okay. Are you familiar with the term "naturally occurring asbestos"?
A. Yes.
Q. Now, I think that's -- I've been told in some ways that's kind a misnomer, in that all asbestos is naturally occurring.
A. Right.
Q. But what I'm speaking of particularly is asbestos, and particularly the Libby amphibole, that was not released as part of Grace's vermiculite operation. Are you familiar with what I'm talking about?
A. Yes.

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Q. Do you have an opinion about, and we're going to just use the term "naturally occurring asbestos"?
A. Yes.
Q. What is your opinion?
A. My opinion is that in over thousands of years with deposits up there on the hill and natural erosion, that there could be some naturally occurring asbestos, but I think that the releases from that compared to releases from activities associated with the mine would be, would be much less.
Q. Where would the naturally occurring asbestos be located?
A. What do you mean "be located"?
Q. Well, I mean, for example, if I'm in the center of Libby, you know, let's say St. John's Hospital, is there naturally occurring asbestos in the soil right there?
A. Well, I don't know that.
Q. Okay. Do you have an opinion as to where naturally occurring asbestos would most likely be found in the Lincoln County area?
A. I guess I don't.
Q. Okay.
A. I mean in terms -- are you referring to asbestos that moved somewhere else, or what's in the

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actual mineral deposits that existed?
Q. Mineral deposits the existed.
A. Yeah, I think it could be -- I think it's been found in some of the river areas, if I remember right, and I don't spend a lot of time reading the mineralogy journals, but -- (pause.)
Q. Right. Are you aware if there are any mineralogical differences between the Libby amphiboles that were released from the vermiculite mining operation as opposed to those Libby amphiboles that have occurred naturally?
A. You're referring to the Gunter papers, probably?
Q. Yes.
A. I believe he's contending that just recently, yes, that if it doesn't have the sodium/potassium peak, then it's not from the mine. So I'm aware of some of that work, yes.
Q. Did you in any way when conducting this -- let me start over.
Have you analyzed any of your samples using Dr. Gunter's analysis to determine whether the asbestos that you detected was from the mining and milling operation as opposed to naturally occurring asbestos?
A. Well, we haven't -- for one thing, I'm not,

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I'm not -- I think there's a lot of variability in what we would find in given deposits. In other words, when Meeker did his work, he looked at, you know, a larger number of samples than previous researches, and now Gunter has looked at many more samples. So I think that, you know, there's going to be variability in what we see based on the number of samples, and I think that Gunter is drawing some conclusions that I'm not saying I'm going to agree with.
But in terms of your question, you know, we sent all our samples in for transmission electron microscopy so we get the peaks with the results. And I can only tell you the only ones I've looked at would be the recent ones that we've done, because I haven't had time to go back and look at the other ones, but I think I will. And we found the sodium/potassium peaks in 60 percent of the last batch of samples we've taken from the forest.
Q. Okay. And those peaks would suggest that they were actually from the milling operation?
A. From the mine.
Q. Mine.
A. What Gunter is calling "the mine."
Q. Right, the mine. This 2006 paper, though, the samples that were reported in this paper, you've in no way analyzed them in a method that would enable you to say

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whether or not they were from the mining and milling operation as opposed to just naturally occurring asbestos, correct?
A. We could do that. I mean we have the peaks, like I'm trying to tell you.
Q. But you haven't reported that, correct?
A. No, we have not reported that.
Q. Okay. Nor have you, sitting here today, analyzed these data for those purposes?
A. No.
Q. Okay. Looking back at Table 1, it looks, if I'm not mistaken, and correct me if I'm wrong, that there were quite a few amphibole fibers in the tree bark from sample 1A on Location 1, correct?
A. Yes.
Q. And 530 million amphibole fibers per gram of bark. Did I read that correctly?
A. So which sample are we looking at again?
Q. I'm looking at the first sample, Location 1, amphibole fiber per gram of bark.
A. Yes.
Q. So that translates to 100 million fibers per cc, correct?
A. Yes.
Q. And would that number include fibers less than

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5 microns?
A. Yes.
Q. Okay. So in this table, you haven't differentiated between fibers that are shorter than 5 microns and those that are longer, correct?
A. Yeah. The process that we use is called AHERA TEM, basically. And so we ask the lab to report results back for all fibers greater than 0.1 micrometers in length. So we get it broken down by -- we got it broken down by less than 5, greater than 5.
Q. Would that include cleavage fragments as well?
A. No.
Q. Okay. But it would include fibers less than 5 microns in length.
A. Correct.
Q. Okay. So it would, this would be a distinct -- well, let me rephrase that.
In order to compare these data to, let's say, Amandus's data, you would need to exclude fibers less than 5 microns in order to do an apples-to-apples comparison, correct?
A. Well, yeah, these are bark samples. I mean we aren't talking about air samples.
Q. These are just bark samples.
A. These are bulk samples.

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Q. Right. So these -- so that's a fair point. So these are not directly correlated to airborne exposures, right?
A. No. These are, these are media samples. These are samples in a given media like bark.
Q. Okay.
A. I would certainly make no attempt to compare it to, you know, airborne.
Q. Would you be willing to offer an opinion as to what the potential airborne exposures would be from these trees given those measurements, those bulk measurements?
A. Well, just looking at the amount in bark, no, because again, that's why we've tried to conduct other studies. We're trying to find out: Well, if it's in the media, then how does it get out of the media?
Q. Right. And that's what your 2007 study relates to, correct?
A. Right.
Q. So this study, this would not support an opinion that there are actual exposures occurring because of the asbestos that had been trapped in the barks of trees. This study merely identifies the presence of asbestos fibers in the barks of trees, correct?
A. It supports the scientific hypothesis that asbestos fibers traveled through the air and deposited on

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these trees.
Q. Okay. But as we stated earlier, you didn't differentiate between fibers that were naturally occurring as opposed to those that were released from the Grace mining/milling operation, correct?
A. Well, in this particular paper. I told you we have looked at bark samples from the same area and they contained the sodium/potassium peaks.
Q. But you haven't reported or produced those findings?
A. No, we haven't.
Q. Okay. And you certainly haven't produced them in this case, correct?
A. That's correct.
Q. Okay. Looking back at the table, Location 4 is your control, correct?
A. Yes.
Q. And that is Albany, New York, and it's a pine tree. And you detected no amphibole fibers, correct?
A. Correct.
Q. Location 5 is on the rail line, correct?
A. Yes.
Q. And you detected 19 million amphibole fibers per gram of bark, correct?
A. Yes.

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Q. And that translates to 5.8 million fibers per cubic -- per square centimeter, correct?
A. Yes.
Q. Now, one thing I noticed was the analytical sensitivity for Location 5 as opposed to Location 4. And analytical sensitivity, is that the lowest level that you would be able to detect? How would you describe "analytical sensitivity"?
A. It's the lowest detect limits for a fiber that a lab can do and get repeatable results. So depending on what method you're collecting samples by, whether you're doing like PCM analysis where they just count fibers, that has a different analytical sensitivity than when they're doing TEM on an air sample. And then when they're doing bulk sample, so these are essentially bulk analysis, there's going to be a different analytical sensitivity associated with that.
Q. And so if I understand that correctly, 19 million was the analytical sensitivity for the sample from Albany, New York, correct?
A. Yes.
Q. And the one, the analytical sensitivity for Location 5 which was in Libby by the rail station was 1.2 million, correct?
A. Yes.

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Q. So if there had been 10 million amphibole fibers per gram of bark in the Albany, New York pine, you would not have been able to detect that, correct?
A. Well, yeah. It's really based on their ability to be able to count. Usually, TEM analysis in terms of at least an air sample, they want the ability to be able to see 1 fiber per square millimeter of filter that they analyze. Okay? So it's really, I think, related more to the type of material, the bulk of material that they analyze.
Q. More related to the type. So why was the analytical sensitivity so much lower for Location 5 as opposed to the control group?
A. It could be because there's different types of bark, different types of tree. This is a big variable in all this work --
Q. Right.
A. -- is different trees have different bark. So that would be the best I can explain it. I mean Jim Webber would be the best person to explain that. He's the analyst.
Q. But, I mean, just so I -- kind of going back to one of my previous questions: If there had been 10 million amphibole fibers per gram of bark in Location 4's sample, it still would have not been detected given that

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analytical sensitivity, correct?
A. Well, I don't know if that's entirely accurate, because like I say, they do the method so that they can detect a certain number of fibers per area of what they're analyzing. So I don't know. I see what you're going -- I see where you're going with your question, but -- (pause.)
Q. Right. But it's something that --
A. I don't know if that's right or wrong.
Q. Okay; okay, that's fair. But Location 7 was the Libby Middle School track and there were 0.13 million amphibole fibers per gram of bark and 0.25 million amphibole fibers per square centimeter, correct?
A. Yes.
Q. And again, the detection analytical sensitivity for Location 7 was 0.13 million, correct?
A. Yeah.
Q. And the amount detected was right at that analytical sensitivity level, correct?
A. Pretty close.
Q. Needless to say, if the same analytical sensitivity used for Location 4 were used on Location 7, none would have been detected, correct?
A. Well, if that analytical sensitivity applied to that sample, yeah, but I don't think it does.

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Q. Why is that?
A. Well, because I've tried to explain what I know about it, is the fact that it's going to depend upon the sample preparation, the type of bark, the amount of bark that they use. I mean, for example, if I collected air samples and I send in five different air samples to a lab for TEM analysis, the analytical sensitivity for every one of those samples is going to be different because of the volume of air that we collect.
Q. Right. So the -- I understand why you have different sensitivities; however, the sensitivity is still a, if you will, a cutoff point below which you cannot reliably report the data, correct?
A. In that sample, yeah.
Q. Right. And so to the extent that there -- if there had been, for whatever reason, a 19 million fibers per gram analytical sensitivity for Location 7, it certainly would not have been able to detect the 0.13 million amphibole per gram of bark that you reported, correct?
A. Well, yeah, again, if that sensitivity applied to those different samples. I mean I would have to say what I'd say before. I don't know if that's accurate or not.
Q. Okay. So sitting here today, you really can't

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speak to that either way?
A. No.
Q. Okay. And Then Location 8 was Asa Wood Elementary School. I take it that is in Libby; is that correct?
A. Yes.
Q. And there were no fibers detected there, correct?
A. Right.
Q. So we see a great range of asbestos in the trees, with one end of the spectrum being Location 1, which is, as you said, on the mine site; with Asa Wood Elementary in town, where no fibers were detected in the bark, correct?
A. Exactly. We were trying to do that very thing. We wanted to start at the mine and then go out.
Q. Okay. Of course, as I said earlier, Locations 1 and 2 where you had the highest exposures, people just can't walk onto those areas without first getting clearance in EPA, correct?
A. Right.
Q. Okay. In doing your analysis, did you ever try to identify whether there was any vermiculite deposits within the bark?
A. I guess I don't understand that question.

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Q. Well, is -- vermiculite dust, can that be transferred through the air?
A. Oh, sure, I'm sure it could.
Q. And vermiculite dust could have ended up on the bark of tree as well, correct?
A. Sure.
Q. And if there was a high level of vermiculite dust in the tree, that would, perhaps, suggest that the dust had come from the mining and milling facility as opposed to naturally occurring asbestos, correct?
A. Because vermiculite can't be naturally occurring? I'm not following your logic.
Q. Well, I mean, vermiculite -- it occurs in Vermiculite Mountain, correct?
A. Yeah.
Q. And that's the primary source of vermiculite in the area, correct?
A. Yeah.
Q. So to the extent that there was vermiculite in tree bark, what other sources of vermiculite would you attribute that to other than from Vermiculite Mountain?
A. Well, I wouldn't attribute it to any.
Q. Right. And so would that have been a way of determining whether some of this asbestos was actually coming from Vermiculite Mountain, whether there was

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actually vermiculite dust located there as well?
A. I guess it could have been.
Q. Okay.
A. I mean we were studying asbestos, but -- (pause.)
Q. Right. So there's no, in any of these studies -- no time in any of these did you actually identify whether vermiculite itself was present, correct?
A. Well, not to my knowledge. I haven't seen all of the scans from all of these different samples, either, so --
Q. But it certainly hasn't been reported in the papers?
A. It hasn't been reported in the papers.
Q. Right. And you certainly haven't produced that in this case.
A. (Nodding head affirmatively.)
Q. Now, on page 464, the last paragraph before "Discussion":
"SEM observation revealed that the amphibole fibers were deposited on the surface of the bark and not through its depth. Most of the fibers were located in the crevices and wrinkles of the bark rather than on its smooth surfaces."
Did I read that correctly, sir?

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A. Yes.
Q. Could you explain in lay terms what that means?
A. Well, it just means if you look -- I think the easiest way is just to look at the pictures. It refers you to these pictures.
Q. I like pictures.
A. Well, I mean, you know, so the purpose of the pictures is that you look at Figure 2 and you can see certain long fibers. And then you look at exactly the same spot on the micrograph that was blown up to larger magnification, and you start to see many more fibers that are embedded deeper into the bark. So you look at the bark surface under a microscope. As you could imagine, it's going to be rough and a lot of little crevices and stuff. So basically, it just -- it works its way into the crevices and stays there.
Q. Now, do trees shed their bark over time?
A. Some do.
Q. Do you know whether these particular trees do?
A. I think some of these species do. I'm not a botanist so I'm not going there.
Q. Who is the botanist on this?
A. Well, we had, early on we had a student who was doing some of the bark - what's the word I'm looking

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for - classification. I mean I can go out and look at a tree and I don't know what kind of tree it is. So that's about all I can say about that. I mean that's -- the question that we always get is, you know: How does bark relate to all of this?
Q. Right.
A. Or tree species.
Q. Right. And so sitting here today, you have no opinion as to how that would impact your data?
A. Well, tree species, we only sample at a certain distance where we can reach a tree. I mean if you go -- what happens if you go up into a tree? Are there fibers loosely held on the pine needles? You know, this is just very exploratory.
Q. Right. And at this point, you know, there were, there were eight samples, one of which was a control, so -- actually, I don't see a Sample 6, so I guess there were seven samples, one of which was a control; so six actual samples, two of which were in the restricted area, and one of which was also right at the intersection the Rainey Creek Road and Highway 37, correct?
A. Yes.
Q. Do you believe that those samples and the findings in those samples are representative of the forest

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in Lincoln County in general?
A. Well, you don't have to rely on my -- or our paper for this particular question because all you have to do is go to the EPA Web site. And just like those other EPA papers I'm referring to, you can get them off the Web site; that you asked them if I cite them or not, well, they're on the web site. But anyway, you can go to EPA's Web site and you can see a map of what they found in the bark going from the mine all the way across Lake Koocanusa and they will give you concentration gradients going beyond the mine.
Q. Right.
A. So you can draw your own conclusions from that.
Q. Okay. But your conclusions, based on your analysis, you would not purport to have taken a representative sample in this paper, correct?
A. In this paper, we were starting at the mine. We wanted to -- we assumed that would have the highest level of contaminants. And then we worked our way away from the mine. That was the point.
Q. Okay. It was not to say -- to speak or give conclusions about the forest as a whole, correct?
A. Well, that's not entirely correct, no, because obviously, if you would -- if we find it, you know, we

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even find half the concentration at the road so many miles down from the mine, then we could assume that the forest in the same circle around that same area could be similarly contaminated.

Q. Did you make any effort to randomly select or select a representative sample of the trees that were in the area off of the mine?

A. Well, we tried to -- we basically tried to sample in areas which we could easily access, since we were all suited up and it's very difficult work.

Q. Sure.

A. And so, you know, that would be a good question. And basically, we tried to collect samples from areas moving down from the mine off roadways as far as we could get, and we did try to, over time, have tried to collect samples from representative tree species.

How come you and I are the only ones interested in this paper?

Q. I think, I think it's fascinating. So, just so I understand what you're saying: You start at the mine, you move farther away all the way in town. However, would you feel comfortable extrapolating these findings to trees that were 5 to 10 miles due south of the mine?

A. Well, I mean we didn't have the resources or the manpower to do that sort of approach, so EPA took our

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-- basically what we found after we reported this to EPA, then they did their sampling. They dropped people in by helicopter and took samples on these lines going from the mine.

Q. Okay.

A. In all directions.

Q. So EPA's work, you believe, constitutes a more representative analysis or -- let me rephrase that.

The sampling done by EPA, in your opinion, was more comprehensive in its attempt to sample a more representative sample of the trees?

A. Representative area around the mine, yes.

Q. Right, okay. And I guess, you know, I don't -- you're not purporting to do so here. I'm just trying to make the record clear on this. This is not a paper that is trying to take a number of samples and then extrapolate those findings to the forest in general. That's not what this paper seeks to do, correct?

A. I don't believe we have enough samples to do that.

Q. Okay. That is just what I was trying to make clear. Moving on to page -- well, staying on page 464, I'll move back to the figures, in the "Conclusion," and this is, I guess, the last two sentences on this page, I'm going to read this, and let me know if I read this

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correctly:

"The result of the railroad sample raises the possibility that the transportation corridors through which Libby vermiculite was hauled to other locations throughout the United States may also be contaminated. This suggests that similar studies of bark from trees near vermiculite processing sites across the country could be used to determine the extent of amphibole fiber contamination in those locales."

Did I read that correctly, sir?

A. Yes.

Q. And if I understand this correctly, you're saying that because this Libby vermiculite was taken across the country, it is possible that we would find exposures had occurred that resulted in asbestos fibers being deposited in trees far, far away from the Libby mine, correct?

A. Is what it's really saying is that, you know, since we've done this work, this approach has been done in other areas of the country. Back in New York, they've used the same approach near chrysotile mines and used to identify, you know, the dispersal of asbestos. So that's what really this is saying, is that this can be used as an approach to track where asbestos goes.

Q. Right.

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A. I think that's all it's saying.

Q. Well, I guess the language I focused on, though, was: "That the transportation corridors through which Libby vermiculite was hauled to other locations throughout the United States may also be contaminated."

A. Yes.

Q. And you agree with that statement?

A. Yes.

Q. Okay. So it is quite possible that there are forests outside of Lincoln County in which unexpanded vermiculite was taken through that area and people who engage in certain activities in that forest may be exposed to asbestos, correct?

A. Well, I don't like your use of the word "forest." I mean we're talking about areas adjacent to like a railroad track.

Q. Okay. But trees near a railroad track, correct?

A. And I'll buy that one.

Q. Okay. So let me start that over, then. Is your opinion, then, that because unexpanded vermiculite was sent all across the country, that it is quite possible that there were releases of asbestos that were retained by trees? Correct?

A. Yes.

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Q. And a person who engages in certain activities around those trees may be exposed to asbestos from this tree, correct?
A. If they performed some activity that disturbed the media, sure.
Q. Okay. And this would be asbestos that came from unexpanded vermiculite, correct?
A. Yes, or, I guess, asbestos that came from anywhere if it was transported through that area.
Q. Right, right. Which unexpanded vermiculite was, correct?
A. Yes.
Q. Okay. The same kind of unexpanded vermiculite that was found around Libby, correct?
A. Yes.
Q. Okay. If we could move to Exhibit 4 again, which was your harvesting simulations. Now, earlier you corrected me when I made an ill-advised attempt to compare bulk sampling to air samples, that those are not proper data to compare, correct?
A. Yes.
Q. However, here we are now dealing with air samples, correct?
A. Yes.
Q. And these are the kind of data that could be

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compared to exposures that occur on a job site, correct?
A. On a job site where they were sawing up contaminated firewood?
Q. Well, I mean even more generally. The measurements you take of the activity simulated here, those data measurements, those fiber-per-cc measurements, those data could be compared to other types of occupational exposures to asbestos when trying to assess exposure level, correct?
A. Well, just in, yeah, saying we've got this level doing this activity and this level taking a chain saw to a piece of wood; yeah, we can do that.
Q. Okay.
A. I don't know what it means. This was designed to look at what happens if we start handling these trees.
Q. Okay. But just so I understand, when we were talking about Amandus earlier, we talked about how exposure data was used as part of an epidemiological study, correct?
A. Yes.
Q. And so presumably, to the extent that you have this exposure data, were you to have information about the duration or circumstances surrounding exposure, you could develop a cumulative exposure for somebody if given the right exposure history, correct?

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A. You may be able to, I guess, as long as we're talking about that particular activity.
Q. Okay. In this case, do you intend to offer any opinions about individuals who have worked in some type of logging capacity in the Lincoln County area with respect to what their exposures may have been?
A. Well, to me, the fact that all of this work started because that's what we were originally proposing was to study logging operations in Libby as a large scale operation, and so we wanted to collect preliminary data, so I guess from that standpoint, we were trying to determine if there was a source of exposure from sawing up wood, yes.
Q. Okay. So the idea of determining whether there's a source of exposure, is it fair to characterize that as a preliminary undertaking?
A. I think -- well, this says "preliminary" in the title. I don't know if you read that or not.
Q. Yes, yes. That's a good point. That's -- okay. So at this stage, you are establishing the existence of potential exposures, correct?
A. Yes.
Q. But you haven't reached a point of actually trying to estimate a cumulative exposure that an individual has had who may have engaged in these

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activities, correct?
A. I have not.
Q. Okay. Nor do you intend to offer an opinion of that nature at the confirmation hearing, correct?
A. That would be fair.
Q. Okay. Now, did you take soil measurements during the course of the sampling activities?
A. For this paper, I don't believe so.
Q. Okay. And some of the activities included literally sawing trees over, correct?
A. Yes.
Q. Let me get a quick list of the activities just so, you know, we're not -- I'm not speculating. Where's -- I believe it's in the paper, but off the top of your head, if not, what are the --
A. Yeah, we basically had -- we tried to divide up into people with different tasks. So we had a chain-sawer; we had a person who would assist the chain-sawer in getting the tree in position, clearing brush; then we would have people that would move the sawed material and stack it --
Q. Which task --
A. -- there were two of them.
Q. Which task did you perform?
A. I was the chain-sawer.

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Q. That's got to be the best job of the bunch.
A. It was.
Q. I think the mover got the short end of the stick. No pun intended.
A. Well, I think the stackers. They were -- they had to rope --
MR. LEWIS: Have you ever been, ever been on a chain saw?
MR. STANSBURY: I have been on a chain saw.
MR. LEWIS: If you get on one of these big chain saws, that's no bargain.
MR. STANSBURY: Oh, it's -- at least it's enjoyable. I've also -- I've been on a chain saw and I've shlepped wood around. And between the two, I'll take the chain saw.
THE WITNESS: But the stackers had to walk, you know. So they'd be walking and there'd be hills. I think they had the worst job.
Q. (By Mr. Stansbury) Okay. And then once the tree had fallen, you would also saw the branches off the tree, correct?
A. Right.
Q. And so as you say, people are walking back and forth throughout this process, correct?
A. Yes.

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Q. Trees are falling from an upright position onto the ground, correct?
A. Yes.
Q. Kicking up whatever debris is on the ground, correct?
A. Correct.
Q. And so, however -- and you're taking measurements of personal breathing zones, correct?
A. Yes.
Q. You're also doing wipe measurements, correct?
A. Yes.
Q. Okay. However, with the personal breathing zone measurements, you did not differentiate between exposures that may have occurred from asbestos coming out of the bark of the tree as opposed to asbestos coming out of the soil, correct?
A. Out of the soil or people walking through brush that wasn't associated. You know, you're walking through brush, I mean like green - what's the word I'm looking for - you know, green foliage.
Q. Right.
A. Yeah, we didn't account for that and we can't account for that.
Q. Okay, okay. And similarly as we discussed earlier, you haven't differentiated between asbestos

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fibers that were from the Libby mining vermiculite operation as opposed to "naturally occurring asbestos," correct?
A. We just looked for Libby amphiboles.
Q. Okay. So the amphiboles that were identified could have been from the bark of the tree, correct?
A. Yes.
Q. Could have been from the soil, correct?
A. Could have been.
Q. Okay. And could have just been naturally occurring asbestos, correct?
A. But all asbestos is naturally occurring.
Q. Well, let me rephrase that, then: Naturally occurring asbestos that was not originally released as part of the Grace mining and milling operation, correct?
A. If it was there, it could have been that, sure.
Q. Okay. Right, just making clear that you did not attempt to differentiate, did you?
A. No.
Q. Okay.
MR. STANSBURY: I think we have 5 minutes left on the tape, so why don't we take a quick break and then we'll resume after that so he can change the tape.
VIDEOGRAPHER: This concludes Tape 3 of the

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videotaped deposition of Dr. Terry Spear.
The time is 1:07. We're off the record.
(A brief recess was taken.)
VIDEOGRAPHER: The time is 1:17. This is Tape 4 of the videotaped deposition of Dr. Terry Spear.
We're on the record.
BY MR. STANSBURY:
Q. Okay. Going back to Exhibit 4, I believe, if we could turn to page 719.
MR. LEWIS: Seven -- excuse me?
MR. STANSBURY: Seven nineteen.
MR. LEWIS: Thank you.
Q. (By Mr. Stansbury) And Figure 1, location of the 2006 harvest, firewood harvesting simulations conducted off of Rainey Creek Road, near the former vermiculite in the EPA-restricted zone near Libby Montana, the distance from Highway 37 to the harvest locations was 1.5 kilometers.
Did I read that correctly?
A. Yes.
Q. So that, the harvest location, that's where these samples were taken?
A. The harvest, yeah -- during this study, you mean?
Q. Yes, sir.

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A. Yes.
Q. Okay. How many trees did you chop down in total?
A. I'm not sure how many trees we chopped down in total. I mean we did -- I believe some of the trees were partially down, some we felled. They're all standing dead. We didn't cut any live trees.
Q. You didn't cut any live trees at all?
A. No.
Q. Okay. If we could turn to Table 2 on page 721, this is TEM wipe sample results from three firewood harvest simulation trials conducted in the Libby EPA-restricted zone near Libby, Montana.
Did I read that correctly, sir?
A. Yes.
Q. Okay. So it sounds like there were three harvest trials. Is that what we were talking about earlier, where you chop down the trees, cut them up, and then haul and stack the wood?
A. Well, a trial was basically over a given period of time. See, we had to limit our time doing this work because of the fact that, again, we were suited up and it was summertime and we couldn't spend too much time in these suits. So a trial would involve like a period of time, 40 minutes - an hour, probably 40 minutes, and

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whatever trees we cut up during that time period would be part of that trial. So we did that three different times.
Q. Okay. And as this indicates by the title of this table, this harvesting occurred inside the EPA-restricted zone, correct?
A. Yes.
Q. Okay. And I believe on page 722 under "Conclusion," the last paragraph of the left column, tell me if I read this correctly:
"The authors recognize that the firewood-harvesting simulations presented in this study represent near worst-case scenarios."
Did I read that correctly, sir?
A. Yes.
Q. Okay. So is it fair to say you would not extrapolate any airborne release findings from this study to similar activities that would occur elsewhere in and around Lincoln County, correct?
A. Correct, unless we knew the bark levels were the same. But we don't know that, so you are correct.
Q. Okay. Did you develop a method for predicting the airborne release that would occur from a given bark level?
A. No.
Q. Okay. Sitting here today, are you able to

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predict airborne releases given bulk measurements of asbestos within bark?
A. No.
Q. Okay. You mentioned in this paper the restrictive zone was once used for logging. Is that correct?
A. That was my understanding, yes.
Q. What was the basis of that understanding?
A. Oh, I think I've -- that's a matter of public record. I believe the Forest Service may have told us that. I think I've seen it in depositions. Yeah, I don't have any doubts about that they were -- that there was logging done off that road or nearby. Jackson Creek Road comes in from the northeast side of that, or mainly the -- I don't know if that's important or not, but -- (pause.)
Q. Well, let's look at Table 1 for a moment.
A. Okay.
Q. Now, this is the --
A. Table 1?
Q. Yes, on page 720.
A. Okay.
Q. Now, this is the PBZ, the personal breathing zone results, correct?
A. Yes.
Q. And the chain saw operator, which we've

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established was you, correct?
A. Yes.
Q. And "n = 3," that means -- what does that equal?
A. Number of samples we collected.
Q. Okay, so number of airborne samples. How long would you take each sample?
A. I think it's stated in here somewhere. Again, it seems like they were fairly short-term samples, less than an hour.
Q. And you then predicted a time-weighted average for those samples?
A. Well, these are sample time-weighted averages, so these are just the concentrations for the sample time. We didn't extrapolate the eight hours.
Q. Okay. So what impact would extrapolating the eight hours have on your findings?
A. Well, if a person did chain-sawing the same amount of time as we did and found the same results, and then if we divided that by eight hours, it's going to go down. I mean the concentration will be less. However, if a person did this particular operation for eight hours, then that would be the eight-hour time-weighted average. Does that make any sense? This is how we try to teach our students.

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Q. Right. I just want to make sure that, you know, the record's clear and that I'm following it, too. So the mean PCM sample TWA -- and TWA is a time-weighted average, right?
A. Yes.
Q. It's 0.72 fibers per milliliter, which is fibers per cc, right?
A. Right.
Q. Okay. And for the operator assistant, it was 0.26 fibers per cc, correct?
A. Yes.
Q. And the stackers, it drops to 0.07 and 0.12 respectively, correct?
A. Yes.
Q. And so the total mean for all tasks was 0.29 fibers per cc, correct?
A. Right.
Q. Okay. Now, do you have an opinion as to the meaning of those findings or the importance of those findings?
A. Well, in my opinion, they aren't very important because obviously, fibers per cc are just that, fibers. You know, there's lots of fibers in the forest.
Q. Right.
A. We're talking about sawdust.

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Q. So we haven't, at this point, reduced it to asbestos fibers, correct?
A. That's right.
Q. Okay. What about the mean TEM sample TWA? Are we then looking at actual asbestos fiber for these measurements?
A. Yes. These are structures per square centimeter -- or per cubic centimeter --
Q. And so the first --
A. -- and broken down by, you know, length.
Q. Okay. So there are two columns -- or three columns of mean TEM data, the first of which measures fibers less than 5 microns, correct?
A. In length.
Q. In length; in length, thank you. The second column measures fibers greater than 5 microns in length, correct?
A. Yes.
Q. And then the third column measures total asbestos fibers irrespective of length, correct?
A. Yes, but basically, it's kind of the combination of the two.
Q. Right. You're basically adding them together, correct?
A. Yeah.

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Q. Okay. And so if we were to want to compare these measurements with Amandus's data, we would use the mean -- would we use the "Mean TEM Sample TWA greater than 5 microns" column?
A. Well, I don't believe Amandus did any TEM. I think it was all PCM.
Q. PCM, right. How would the TEM and PCM compare?
A. Well, generally, we could expect -- I mean if we're just talking about -- let's say we had nothing but asbestos in this room floating around in the air, and if we did PCM versus TEM, we'd see more with TEM because of the greater magnification.
Q. Okay.
A. If you have a mixed, where you've got different types of fibers -- see, TEM is only looking at asbestos. So if we've got mixed fibers, then we may see more with PCM. Does that make sense?
Q. Okay. Why would we see more with PCM? Because we wouldn't --
A. Because it's going to count all fibers.
Q. Right.
A. So it's going to count the asbestos fibers as well as the other fibers. Do you see what I'm saying? I don't know if that makes sense.

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Q. I do. So I'm thinking back to the exposure measurements that Amandus used which used PCM. The actua asbestos present in the air for those measurements may have been higher than what was measured -- than what was reported, rather?
A. Are we going back to the Amandus?
Q. Yes, not focusing on the old pre '68 data. I'm talking about like the data in the late '60s and throughout the '70s through the '80s where they reported in PCM fibers per cc.
A. Well, if there were fibers present that were non asbestos, that would be the case. I don't know if that was true or not.
Q. Okay.
A. You know, and the other -- with PCM, you just have to keep in mind that they're counting fibers, but for one thing, PCM can only see a diameter of a fiber like 0.25 micrometers in diameter. So if there's real thin fibers, we're not even going to see them under the microscope, whereas with TEM, we would see it. So that's kind of another reason why we might see more TEM fibers if we had the same, the same asbestos atmosphere.
Q. So is it fair to say that, and based on this paper, one of the worst-case scenarios you would anticipate in terms of exposure for a chain saw operator

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would be 0.11 fibers per cc if we were to count all fibers, including those shorter than 5 microns, correct?
A. Are we looking at the last column? Where are we looking at?
Q. The last column, the chain saw operator.
A. Chain saw operator. So for that number of samples, pretty limited number of samples, yeah, we found that number.
Q. Right. And again, just so the record's clear, this is what the paper states is a worst-case scenario of potential exposure, correct?
A. Well, we called it "worst case" simply because we felt that the mine would be most likely to have the highest contamination. We were on the mine road.
Q. Right, right. So --
A. Is that worse than being somewhere else on the mine road? I don't know.
Q. But in terms of being somewhere in Lincoln County forest area using a chain saw, an area that is away from the mine, you would not expect to see exposures higher than this, would you?
A. If we knew that the concentration in the media was less, yeah. We would assume that it would be less.
Q. You would assume it would be less, right.
A. But, you know, you can't make those

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conclusions unless you knew.
Q. But again, you would not extrapolate these measurements to other parts of the forest without some form of measurement done in advance, correct?
A. Right. And we haven't attempted to do that.
Q. Okay. So I just want to make sure the record's clear that you were not stating based upon this paper, you believe similar exposures are occurring throughout the Lincoln County forest, correct?
A. Right. A very limited number samples, a pilot study, preliminary data, the only thing we can say from this study, basically, is that if you work on contaminated trees, you can put fibers into the air or get them on your clothes.
Q. Okay. And but fair to say, you stated earlier, at the confirmation hearing, you are not going to offer an opinion about any specific individual's potential exposures from having worked as a chain saw operator in Lincoln County, correct?
A. No.
Q. Okay.
MR. LEWIS: That's a double-negative, Counsel. You asked -- I don't think you want the answer to stand as stated.
MR. STANSBURY: Could you repeat the last

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question?
MR. LEWIS: But the answer is "no," he's not going to be offering any testimony on that last subject.
(The record was read by the court reporter as follows:
"QUESTION: But fair to say, you stated earlier, at the confirmation hearing, you are not going to offer an opinion about any specific individual's potential exposures from having worked as a chain saw operator in Lincoln County, correct?
"ANSWER: No.")
MR. STANSBURY: Is that a double negative?
MR. LEWIS: Yeah, it is.
MS. ROHRHOFER: I'm not an English major. I think --
MR. LEWIS: You asked if it's correct that he's not going to, and he said "no."
But anyway, he's not, just for the record, he's not going to offer any testimony as to that last question.
MR. STANSBURY: I'll ask him one more time.
BY MR. STANSBURY:
Q. You're not going to offer any -- is it correct to say that you will not offer any testimony at the confirmation hearing about an individual's potential

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exposures from sawing, hauling, or stacking wood in the Libby forest?
A. That would be correct.
Q. Okay.
MR. STANSBURY: I appreciate you looking out for me, Tom.
MR. LEWIS: Well --
MR. STANSBURY: That's good. You're right.
MR. LEWIS: It doesn't have any -- he's not going to testify about that.
Q. (By Mr. Stansbury) And we stated earlier that your 2009 paper was not in your expert report, correct?
A. Correct.
Q. And you don't intend to offer any testimony related to that at the confirmation hearing, correct?
A. No.
Q. Okay. And again so the record's clear, we looked through your report and although we did see references where you were talking about medical findings, you yourself are not a medical doctor, correct?
A. That's correct.
Q. You don't intend to offer any medical testimony about asbestos disease, correct?
A. No.
Q. Okay. Nor are you a toxicologist, correct?

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A. That's correct.
Q. You do not intend to offer opinions about toxicity of amphiboles in Libby, correct?
A. Correct.
MR. LEWIS: Don't ask these questions over again. Please don't. They're repetitive.
Q. (By Mr. Stansbury) Nor are you an epidemiologist, correct?
A. Correct.
Q. You're not going to offer epidemiological opinions, correct?
A. That's correct.
Q. Okay.
MR. STANSBURY: Pass the witness.
MR. LEWIS: Okay. Did we get -- what you referred to as the "Amandus study", was that marked?
MR. STANSBURY: I believe it was.
MR. LEWIS: Is that 7?
MS. ROHRHOFER: Yeah, Exhibit 7.
MR. LEWIS: Okay, thanks. Let me check. I probably don't have any questions.
(Pause in proceedings.)

BY MR. SPEAR:
Q. I guess I want to clarify one thing,

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Dr. Spear. The EPA studies that you considered, you referred to some studies by Paul Peronard. Do you recall that?
A. Yes.
Q. Are those studies that you referenced all publicly available?
A. Yes. They're on the EPA Web site, I believe.
Q. Is that how you obtained them?
A. Yes.
Q. Okay. And does that include the bark studies and the map prepared by the EPA? Is that on the Web site as well?
A. That's a good question.
Q. Do you know when that study and that map was made available to the public or -- let me finish. Let me withdraw the question.
Do you know when that EPA study, the bark study and the map that you described, was issued by the EPA?
A. My recollection is it was in 2008.
Q. Do you know if it was before or after your report?
A. Before or after this report.
Q. Your expert report.
A. My expert report. I guess I don't know the exact timeline.

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Q. All right.
A. I mean I just know that because of our work with the Forest Service, we had to have access to that map. I mean we've, we've been working with EPA.
Q. And that's the Forest Service work that you're engaged in right now that's not been completed --
A. Yes.
Q. -- is that correct?
A. Yes.
Q. All right. Do you know where that map can be found?
A. I don't know what you mean. I have it, the Forest Service has it, EPA has it. I don't know if they've released the map.
Q. Okay.
A. I just don't know. I'm just being honest with you, I don't know.
Q. Okay.
A. I mean it isn't in a publication because we don't, we don't know if we have the right to put that in there.
Q. And you do not, is it -- I don't know if you testified about this: Do you or do you not intend to rely on that map for your testimony in this case?
A. Well, to me, it described the spread of

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asbestos from the, from the mine. But I don't -- I haven't offered it as an opinion, so I just brought it up in the case of cross-examination, so I probably wouldn't rely on it.
Q. Okay. You, in your report --
MR. LEWIS: Excuse me, Counsel.
Q. (By Mr. Lewis) I'll refer you to Exhibit 4. You talk about a harvest location.
A. Looking at the map?
Q. Yes, it's Figure 1 on page 719.
A. Okay.
Q. I want to clarify. The harvest location was not on the mine site. Is that true or untrue?
A. That is true.
Q. Okay. Do you know where the screening, what has been called the "screening plant" is located on the Kootenai River?
A. By the -- yes.
Q. Okay. Is that at the intersection of the river and Rainey Creek Road?
A. Yes.
Q. How far was the harvest location from the screening plant?
A. Well, what did we say -- whatever the distance was given up that road. I think we state 1.5 kilometers.

Q. Okay.
A. From Highway 37, so we add another --
Q. So less than a mile?
A. Yes.
Q. Okay. That's all I have.
MR. LEWIS: I'll reserve the rest of my questions in time of -- until the confirmation hearing.

BY MR. STANSBURY:
Q. Just one quick clarifying point. The harvest location was not on the mine, but it was in the EPA-restricted zone, correct?
A. Yes.
Q. Okay.
VIDEOGRAPHER: Anybody else on the line? Everybody done?
MR. LEWIS: Are there any questions?
MR. STANSBURY: Going once, twice. All right, everybody.
VIDEOGRAPHER: Okay. This concludes the videotaped deposition of Dr. Terry Spear in the matter of W.R. Grace & Company, et al., Debtors.
The time is 1:37. It's July 29, 2009.
We're off the record.
* * * * *

STATE OF MONTANA)
: ss.
County of Silver Bow)

I, Candice L. Nordhagen, Registered Professional Reporter, Notary Public in and for the County of Silver Bow, State of Montana, do hereby certify:

That the witness in the foregoing deposition, Terry M. Spear, Ph.D., was by me first duly sworn according to law in the foregoing cause; that the deposition was then taken before me at the time and place herein named; that the deposition was reported by me in machine shorthand and later transcribed by computer, and that the foregoing two hundred fourteen (214) pages contain a true record of the witness, all done to the best of my skill and ability.
IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal this _____ day of _____, 2009.

_____
Candice L. Nordhagen

Notary Public for the State of Montana residing at Butte, Montana. My commission
(NOTARIAL SEAL) expires September 15, 2011.

DEPOSITION OF: TERRY M. SPEAR, Ph.D.
DEPOSITION DATE: JULY 29, 2009
IN RE: W.R. Grace & Co, Debtor
COURT REPORTER: CANDICE L. NORDHAGEN
I have read my deposition and make the following corrections or additions:

PAGE # LINE CORRECTION

Signed under penalty of perjury this _____ day of _____, _____.

_____
Terry M. Spear, Ph.D.

Q